

Northeastern University

Graduate School of Arts and Sciences

NOTE:

This catalog, published 9/85, was reprinted with no changes for the 1986-87 academic year.

Graduate School of Arts and Sciences

Northeastern University

*400 Meserve Hall
360 Huntington Avenue
Boston, Massachusetts 02115
Telephone: 617-437-3980*

Contents

1	<i>Introduction to Northeastern University</i>
3	President's Message
5	About Northeastern University
7	Research at Northeastern University
10	Northeastern University in Boston
11	Graduate Degrees and Programs
18	<i>The Graduate School of Arts and Sciences</i>
19	General Regulations
26	The Master's Degree
27	The Doctor of Philosophy Degree
29	Interdisciplinary Programs
32	<i>Fields of Study</i>
33	Biology
45	Chemistry
53	Interdisciplinary Graduate Chemistry Programs
53	Clinical Chemistry
58	Economics
68	English
81	History
87	Journalism
91	Law, Policy, and Society
101	Mathematics
109	Physics
122	Political Science
133	Psychology
141	Sociology and Anthropology
158	<i>General Information</i>
159	Financial Information
164	Facilities and Resources
171	Campus Maps
174	Governing Boards and Officers of the University
186	Index



Introduction to Northeastern University



President's Message

We are pleased that you are considering Northeastern University as the university for your graduate studies. Our graduate programs offer students academic excellence in an environment oriented to both scholarship and practical skills. The University is committed to having the highest quality faculty and to supporting research in all its disciplines.

Northeastern University offers a variety of programs within each of its nine graduate and professional schools. Each program has been designed to meet the interests and needs of graduate students and the professional climate of the 1980s. As a graduate student at Northeastern, you will find yourself working with students from diverse personal and geographical backgrounds, but with a common commitment to search and learn. These elements, in combination with our Boston location and proximity to many cultural attractions, help to foster an exciting educational environment.

As you read through this catalog, we hope you will find Northeastern University's opportunities for graduate study as dynamic as we do. We encourage you to contact the appropriate graduate school with any further questions you may have. I look forward to greeting you, should you decide to pursue your education at Northeastern University.

Kenneth G. Ryder
President



About Northeastern University

Among the nation's largest private universities, Northeastern University distinguishes itself not only by its immutable dedication to excellence in research and study, but also by its dedication to discovering community educational needs and meeting them. The University has not attempted to duplicate the programs of other institutions, but has sought to pioneer new areas of educational service from its beginning in 1898.

Northeastern University's roots can be found in the "Evening Institute for Young Men" founded in Boston in 1898. Classes in Law were offered at a reasonable cost during the evening for those who worked during the day. The first evening law school in Boston quickly expanded to include other disciplines, and soon added an innovative daytime program which offered opportunities to "earn while you learn." By the time Northeastern was incorporated as a university in 1922, the school had committed itself to "cooperative education by day, adult education in the evening."

Over a half century later, Northeastern University has become a large comprehensive university with eight undergraduate colleges, nine graduate and professional schools, numerous suburban campuses, and an extensive research division. Incorporated as a privately endowed, nonsectarian institution of higher learning under the General Laws of Massachusetts, Northeastern, like other private universities, is governed by a Board of Trustees, elected by and from the Northeastern University Corporation, which is composed of about 200 distinguished business and professional men and women across the country. The Board of Overseers, chosen from the membership of the Corporation, based on their exceptional interest in and support of the University, is also a participant in the affairs of the institution.

Northeastern University has developed a national reputation as the leader in cooperative education. The Cooperative Plan of Education, initiated by the College of Engineering in 1909 and subsequently adopted by the other colleges of the University, enables students to alternate periods of work and study. This

educational method offers students an opportunity to gain valuable practical experience as an integral part of their education and also provides the means by which they may contribute substantially to the financing of their education. Begun at the full-time undergraduate level, the Plan has been extended to the graduate level in engineering, business administration, law, professional accounting, and criminal justice.

In the field of adult education, the University offers full and part-time graduate degree programs that are specifically designed to meet the needs and interests of adults who wish to further their education. The University's nine graduate and professional schools—Arts and Sciences, Boston-Bouve College of Human Development Professions, Business Administration, Computer Science, Criminal Justice, Engineering, School of Law, Pharmacy and Allied Health Professions, and Professional Accounting—offer programs leading to Master's and Doctoral degrees. The School of Engineering Technology (formerly Lincoln College) and University College offer part-time undergraduate programs leading to Associate's and Bachelor's degrees (in humanities, business administration, and technical disciplines), while the Division of Continuing Education offers nondegree courses.

Northeastern University is an exciting and dynamic university in which to pursue your academic aspirations. It is also a modern, urban institution dedicated to meeting the practical challenges of the times and the community.

Research at Northeastern University

Research and scholarship are an integral part of Northeastern University's activities, promoting the intellectual growth and development that help to ensure the University's continued ability to provide quality education to its students.

The first formally organized research group at Northeastern University was the Bureau of Business Research, established in 1939 to study business principles and practices. Thereafter, research efforts on campus increased so rapidly that in 1954 a Faculty Committee on Development and Coordination of Research was established to help unify and provide direction to scholarly activity at Northeastern. From an initial grant of \$10,000 awarded to the Physics Department by the Office of Naval Research in 1945, sponsorship for University research efforts has grown to involve millions of dollars each year.

Responsibility for fostering and coordinating the development of research at Northeastern resides with the Vice President for Research who is assisted by the University Council on Research and Scholarship and the Office of Sponsored Programs. A semi-annual newsletter entitled *Re: Search* brings information about the research and scholarly efforts of Northeastern University's faculty and students to the University community and the general public.

Northeastern's funding for research comes from a variety of sources including the National Institutes of Health, National Science Foundation, the National Endowment for the Humanities, IBM, Dow Chemical Company, and the Mellon Foundation, as well as from the University through the Research and Scholarship Development Fund.

Northeastern University has numerous distinguished faculty members, many of whom have received prestigious awards, including Sloan Scholarships, Guggenheim Fellowships, and National Institutes of Health Research Awards. Faculty members lecture the world over. In addition, many faculty members serve as consultants to industry and U.S. Government agencies and participate on a variety of national and international committees.

Current research activities span almost every academic field and include laboratory projects, theoretical studies, and technological applications. Research is under way in the areas of business, physical and biological sciences, social sciences, humanities, allied health professions, and engineering. Student participation in these activities can take place as part of regular academic programs in the form of thesis projects, specially designed independent studies, or through cooperative work assignments. Research involvement is actively encouraged and is limited only by the student's own motivation and curiosity.

University Institutes and Research Centers

Northeastern University operates a number of interdisciplinary institutes and research centers to provide administrative support and coordination for research efforts in key areas.

- Cooperative Education Research Center
- Center for Applied Social Research
- Arts and Sciences Center for Asian Studies
- Barnett Institute of Chemical Analysis and Materials Science
- Electron Microscopy Center
- Arts and Sciences Humanities Center
- Center for International Higher Education Documentation (CIHED)
- Center for Labor Market Studies
- Marine Science and Maritime Studies Center
- Center for Medical Manpower Studies
- Arts and Sciences Center for Urban Studies
- Center for Urban and Regional Economic Studies
- Academic Computer Service
- Office of Sponsored Programs

Scholarly Journals

Several scholarly journals originate at Northeastern University, including *Studies in American Fiction*; *The New England Quarterly*; *The Scriblerian*; *Journal of Sport and Social Issues*; *Tennessee Williams Review*; *Romanticism: Past and Present*; *Health Values: Achieving High-Level Wellness*.



Northeastern University in Boston

Historically, the city of Boston has played a pioneering role in American education. Today it has one of the largest and most diverse student populations in the country. Within a 25-mile radius of Northeastern University's campus are over 50 degree-granting institutions.

As a graduate student at Northeastern University, you will discover that part of the adventure of studying in Boston is exploring the cultural, educational, historical, and recreational offerings of the city. Northeastern is very much an urban university, and Boston is one of its richest resources.

Boston is both a city of tradition and a city of change. Centuries-old meetinghouses are located beside striking contemporary office buildings and large-scale civic projects. This diversity is reflected in the cultural life of the city as well. Within a short distance of the campus are numerous renowned cultural centers, such as Symphony Hall, the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Horticultural Hall, and the Boston Public Library. Theater in Boston includes everything from pre-Broadway tryouts to experimental and college productions.

For those interested in sports, the Boston Red Sox, Boston Celtics, Boston Bruins, and New England Patriots play all their home games in and around the Boston area.

The University is adjacent to the Fenway, a spacious and naturalistic park designed near the turn of the last century by Frederick Law Olmsted, the world-famous landscape architect, that includes a beautiful rose garden and paths used extensively by Northeastern joggers.

Cape Cod and the North Shore are easily reached by car or public transportation for swimming, surfing, and boating. The scenic areas of northern New England are accessible for skiing, hiking, and mountain climbing.

Boston provides its student population with a stimulating environment in which to learn and grow. In turn, the considerable influence of its universities and colleges and their student populations provides Boston with a young, vibrant, and exciting ambience, quite possibly unequaled anywhere else.

Graduate Degrees and Programs

Graduate School of Arts and Sciences

Master of Arts

Economics

English

History

Journalism

Political Science

Psychology

Psychology: Applied Behavioral Analysis

Social Anthropology

Sociology

Master of Science

Biology

Chemistry

Economic Policy and Planning

*Law, Policy, and Society

Mathematics

Physics

Master of Science in Health Science

Master of Journalism in News Media Management

Master of Technical and Professional Writing

Master of Public Administration

Doctor of Philosophy

Biology

Chemistry

Economics

*Law, Policy, and Society

Mathematics

Physics

Psychology

Sociology

*Interdisciplinary program

Certificate of Advanced Graduate Study
Advanced Literary Study

Certificate

Economics of Manpower and Development Planning
Technical Writing Training Program

*Graduate School of Boston-Bouvé College
of Human Development Professions*

Master of Education

Consulting Teacher of Reading
Counseling
Curriculum and Instruction
Educational Administration
Educational Research
Human Development
Rehabilitation
Special Education

Master of Science

Counseling Psychology
Physical Education
Physical Therapy
Recreation and Management
Speech-Language Pathology and Audiology

Certificate of Advanced Graduate Study

Counseling
Educational Administration
Language Acquisition and Language Disorders
Rehabilitation

Doctor of Education

Leadership: Administration and Supervision
Counseling
Educational Administration
Rehabilitation Administration

Nondegree Programs (Teacher Preparation)

Elementary Education
Moderate Special Needs
Secondary Education
Severe Special Needs

Graduate School of Business Administration

Master of Business Administration

Cooperative MBA

Full-time MBA

Part-time MBA

High-Tech MBA

Executive MBA

Graduate School of Computer Science

Master of Science in Computer Science

Graduate School of Criminal Justice

Master of Science in Criminal Justice

Graduate School of Engineering

Master of Science

Chemical Engineering

Civil Engineering

Electrical Engineering

Engineering Management

Industrial Engineering

Information Systems

Mechanical Engineering

*Transportation

Engineer Degree

Electrical Engineer

Industrial Engineer

Mechanical Engineer

Doctor of Engineering

Chemical Engineering

*Interdisciplinary program

Doctor of Philosophy

Chemical Engineering

Civil Engineering

Electrical Engineering

Industrial Engineering and Information Systems

Mechanical Engineering

*Graduate School of Pharmacy and Allied Health Professions***Master of Science**

Biomedical Science

*Clinical Chemistry

Hospital Pharmacy

Medical Laboratory Science

Medicinal Chemistry

Pharmacology

Master of Health Professions

General Option

Health Policy

Physician Assistant

Regulatory Toxicology

Doctor of Pharmacy

Biomedical Science

Doctor of Philosophy

Biomedical Science

*Interdisciplinary program



PROFESSIONAL SCHOOLS AND DEGREES

Graduate School of Professional Accounting

Master of Science

School of Law

Juris Doctor



The Graduate School of Arts and Sciences

General Regulations

The general regulations of the Graduate School, which follow, are minimal requirements shared by the several degree programs. The student is advised to consult the appropriate departmental section for a statement of additional requirements in specific programs.

Eleven departments in the College of Arts and Sciences offer work at the graduate level. The master of arts degree may be earned in economics, English, history, journalism, political science, psychology, sociology, and social anthropology. The master of science degree is awarded in biology, chemistry, economic policy and planning, mathematics, and physics. The Master of Science in Health Science, the Master of Journalism in News Media Management, the Master of Technical and Professional Writing, and the Master of Public Administration degrees are also offered. In addition, students may earn the certificate of advanced graduate study in the program of advanced literary study.

The doctor of philosophy degree is available in biology, chemistry, economics, mathematics, physics, psychology, and sociology.

Degree options are offered in the interdisciplinary areas of law, policy, and society and clinical chemistry.

Application

Completed applications, recommendation forms, and complete official transcripts should be sent directly to the appropriate academic department. Applicants should make the necessary arrangements, where required, to have official reports of the Graduate Record Examination (GRE) and the Miller Analogies Test forwarded to the office of the Graduate School of Arts and Sciences. (Students interested in clinical chemistry should direct applications to the Graduate School of Pharmacy and Allied Health Professions.)

Prospective students should consult the departmental sections for individual program deadlines for application. While the deadlines vary and exceptions are occasionally made, necessary supporting documents must be on file with the departmental office at least eight weeks before the date of registration

for the quarter in which the student wishes to begin his/her graduate work. However, students desiring assistantships should be aware that priority in these awards is generally given to applications submitted before March 15. Again, departments may have earlier or later deadlines. Please refer to the appropriate departmental section for complete information.

All applicants to the Graduate School are strongly urged to take both the aptitude and advanced portions of the GRE. These tests are presently required by the departments of Biology, History, and Psychology. The Psychology Department also requires that the results of the Miller Analogies Test be submitted. The Sociology/Anthropology Department requires the aptitude test scores (verbal, quantitative, and analytical) on the GRE. (In special cases, Miller Analogies Test scores may be accepted in lieu of GRE scores. Please consult the department.)

Applications for the GRE can be obtained by writing to:

Educational Testing Service
Box 955
Princeton, New Jersey 08540

At least two letters of recommendation are required by all departments; Biology, Math, Political Science, Psychology, and Sociology/Anthropology require three letters. Candidates for financial awards should indicate their candidacy to those supplying references.

Though candidates for admission to Arts and Sciences graduate programs apply through the individual programs, the final decision concerning admissions is made by the Office of the Dean of the College of Arts and Sciences.

International Student Application

International students are responsible for submitting all supporting materials required by the department, as listed above and in the specific departmental section. In addition, each student is required to have a Declaration and Certification of Finances (DCF) form, as well as evidence of English proficiency on file with the Graduate School office at least ten weeks before the date of registration for the quarter in which the student expects to begin a scholastic program.

Evidence of English proficiency may consist of (1) satisfactory results on the Test of English as a Foreign Language (TOEFL); (2) proof of a minimum of four years of study culminating in the receipt of a degree in an undergraduate institution abroad where the medium of instruction is English; or (3) proof of completion of a degree program at an American college or university.

Applications for TOEFL may be obtained by writing to:

Educational Testing Service
Box 899
Princeton, New Jersey, 08540

Students without adequate evidence of English proficiency may be admitted conditionally and evaluated by the English Language Center prior to registration. Students who do not demonstrate adequate English proficiency will be required to enroll in the English Language Center Intensive Language Course for at least one quarter before enrolling in a full academic program. Such students may be permitted, with approval of the Director of the English Language Center and of the academic adviser, to enroll in academic coursework at the same time as they participate in Intensive English.

Admission

To be considered for graduate work, an applicant must submit a complete official transcript, indicating the award of a bachelor's degree from a recognized institution, and provide evidence of being able to pursue creditably a program of graduate study in the chosen field. Acceptance to the Graduate School is granted upon recommendation of the departmental graduate committee after a review of the completed application.

In addition to the above, international students must have submitted evidence of financial support. Those who have not submitted acceptable evidence may not be granted a visa and will not be permitted to register.

International Teaching Assistant Orientation

All international students receiving an assistantship for the first time must participate in a week-long intensive orientation prior to the beginning of the fall quarter. This orientation is intended to provide international teaching assistants with the opportunity to sharpen their speaking and presentation skills, as well as to introduce them to the culture of the American classroom. This orientation and the weekly seminars that are offered throughout the fall quarter are mandatory for first-time international teaching assistants.

Student Classification

Regular Student

Those students who are admitted to a degree program.

Provisional Student

Students whose academic records do not qualify them for acceptance as regular students. Provisional students must obtain a B (3.0) average in the first twelve quarter hours of study or meet specifically delineated departmental requirements to qualify for acceptance to a degree program.

Special Student

Students with a bachelor's degree who are not matriculated in a degree program. All those interested in this status should inquire with the Graduate School office regarding application procedures and deadlines. Acceptance as a special student is in no way related to admission to a departmental degree program. However, those special students subsequently admitted to a degree program may petition through their departments to the Director of the Graduate School to apply the first twelve quarter hours of credit earned as special students toward degree requirements. Special students are expected to maintain a B (3.0) average in the first twelve quarter hours of study.

Doctoral Student

Students admitted to a doctoral program.

Formal Doctoral Degree Candidate

Doctoral students who have completed forty quarter hours of acceptable graduate work, have passed the departmental qualifying examination, and have been certified by the Graduate School of Arts and Sciences.

Registration

Students must register within the dates and times listed on the school calendar. The place of registration will be announced quarterly. Students who fail to register will not earn credit or a grade for the course(s) in question.

Students must obtain adviser approval of course selections each quarter. In addition, once adviser approval has been obtained, their registration materials must be stamped with the official Graduate School of Arts and Sciences stamp by a representative of the students' department or of the office of the Graduate School. The Registrar will not process any registrations submitted without the stamp.

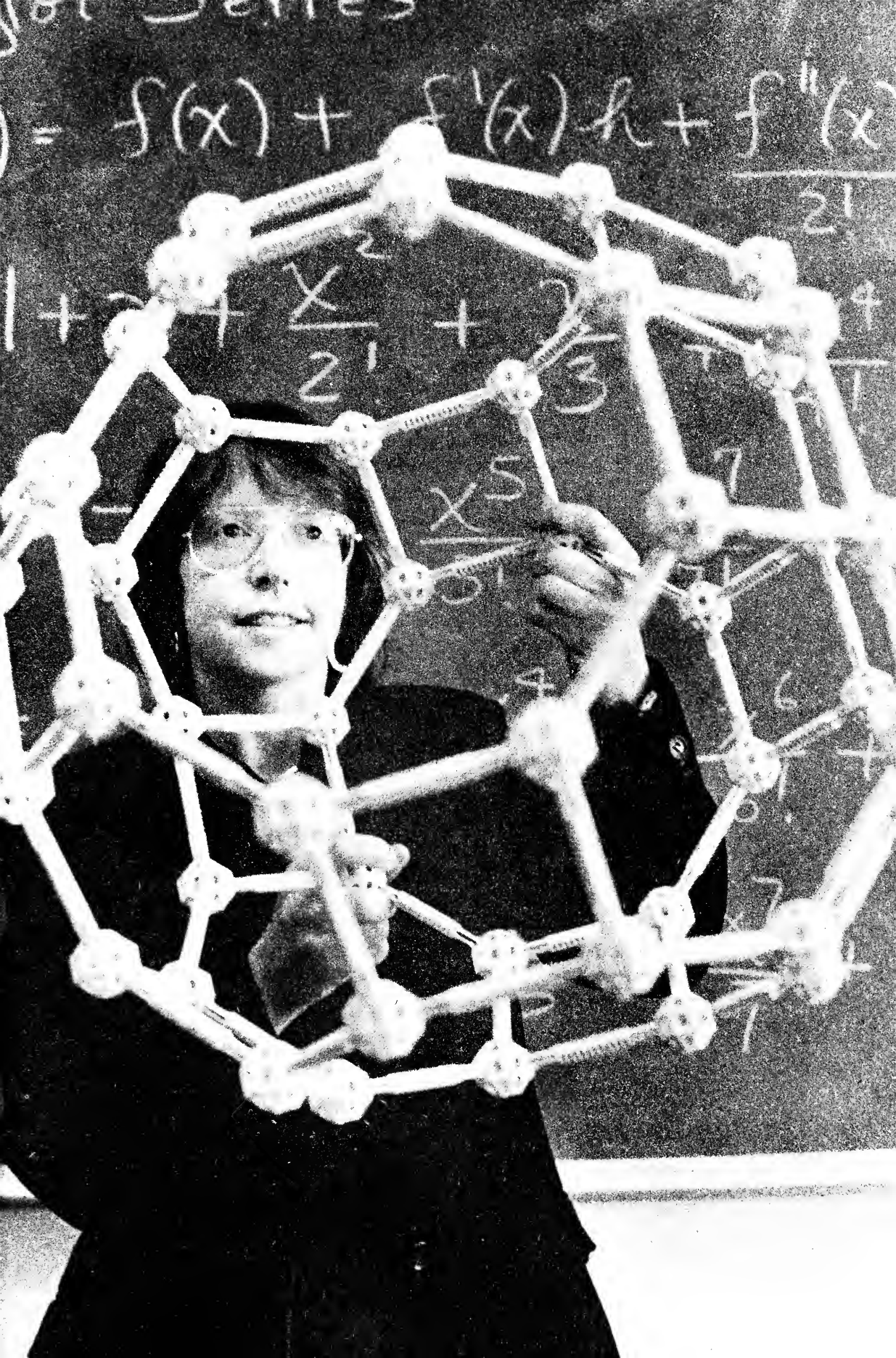
Residence

All work for advanced degrees must be registered for and completed at the University, unless approval has been obtained from the Director of the Graduate School for work taken elsewhere. Procedures for obtaining such approval are described in the section of this catalog on transfer credit.

Programs of Study

A graduate student is considered a full-time student if enrolled in a minimum of either four courses or 12 quarter hours of credit for the quarter with the following exceptions:

- a. Students for whom English is a second language, at the discretion of their department, will be considered full-time if they are enrolled in a minimum of three courses or are carrying 9 quarter hours of credit.



- b. Students who hold Stipended Graduate Assistantships will be considered full-time if enrolled for a minimum of 6 quarter hours of credit.
- c. Students who hold Northeastern University Tuition Assistantships will be considered full-time if enrolled for a minimum of 8 quarter hours of credit.
- d. Students enrolled in doctoral research are considered full-time.
- e. All graduate students who are in continuation status may be considered full-time at the discretion of their departments. It is ordinarily assumed that such students will be in residence, but exceptions are permissible.

Part-time students are not permitted to enroll in more than two courses per quarter without formal approval of the departmental chairperson or a designate. Courses in most fields are offered in both the afternoon and evening.

Grading System

The student’s performance in graduate courses will be graded according to the following numerical equivalents:

A	(4.0)	These grades are given to those students whose performance in the course has been of very high graduate caliber.
A–	(3.667)	
B+	(3.333)	These grades are given to those students whose performance in the course has been at a satisfactory level.
B	(3.0)	
B–	(2.667)	
C+	(2.333)	These grades are given to those students whose performance in the course is not at the level expected in graduate work.
C	(2.0)	
C–	(1.667)	
F	(0)	This grade is given to those students whose performance in the course is unsatisfactory.

In addition, the following letter designations are used:

I	Incomplete without quality designation. This grade may be given to those students who fail to complete the work of the course.
L	Audit without credit.
S	Satisfactory without quality designation.
U	Unsatisfactory without quality designation.
W	Withdrawal after the fifth week of classes.

The I grade will be changed to a letter grade when the deficiency that led to the I is corrected to the satisfaction of and in the manner prescribed by the instructor in the course. The period for clearing such a grade will be restricted to one calendar year from the date of its first being recorded on the student’s permanent record.

Students who wish to audit a course must indicate this to the instructor. While no credit will be given for an audit, audits do appear on the student's transcript. Registration changes from an audit to a graded status in a course may not be made after the first day of classes.

Individual faculty members may choose not to use the plus and minus designations. If they elect to use the whole letters only, they must announce this policy to the class at the beginning of the quarter.

Class Hours and Credits

All credits are entered as quarter hours. A quarter hour of credit is equivalent to three fourths of a semester hour of credit.

Continuity of Program

Students are expected to maintain continuous progress toward their intended degrees. Any student who does not attend Northeastern for a period of one year may be required to apply for readmission.

Withdrawals

In order to withdraw from a course, a student must fill out an official withdrawal form obtained at the Registrar's Office or at the Suburban Campus Office. Withdrawals may be made through the ninth week of the quarter. However, withdrawals that are made after the fifth week of the quarter will be recorded with a W grade on the student's transcript.

Students will be withdrawn as of the date on which the form is received by the Registrar's Office. Ceasing to attend a class or simply notifying the instructor of intention to withdraw does not constitute an official withdrawal.

Changes in Requirements

The continuing development of the Graduate School forces frequent revision of curricula. When no hardship is imposed on the student because of changes, and when the facilities of the school permit, the student is expected to meet the requirements of the most recent catalog. However, if it can be demonstrated to the Director of the Graduate School that doing so does impose a substantial hardship, the requirements in the bulletin of the year in which the student matriculated will be applicable.

Application for the Diploma

Application for the diploma is made by filing a commencement card with the Registrar's Office. Even though all other degree requirements may have been met, the commencement card must be filed on or before the applicable date listed in the calendar in order to assure that the degree will be conferred in the desired year. It is, of course, the student's responsibility to make sure that degree requirements have been met.

The Master's Degree

Academic Requirements

A candidate for the master's degree must complete a minimum of forty quarter hours of graduate-level coursework and such other study as may be required by the department in which the student is registered.

To qualify for the degree, a cumulative average of 3.000, equivalent to a grade of B, must be obtained. This average will be calculated quarterly by the Graduate School according to the grading system as specified on page 24, and will exclude any transfer credits or repeated courses. A student who does not maintain a 3.000 cumulative average for two consecutive quarters or is otherwise not making satisfactory progress toward degree requirements, as specified by the individual department, may be terminated at the discretion of the graduate program committee.

Not more than two courses, or six quarter hours of credit, whichever is greater, may be repeated in order to satisfy the requirements for the degree. Only such repeats will be counted in calculating the cumulative average requirement.

Within the above limitations, a required course for which a grade of F is received must be repeated with a grade of C or better and may be repeated only once. Similarly, a student may elect to repeat a required course in which a C has been received. Elective courses in which an F has been received may be repeated once to obtain a C or better.

Comprehensive Examination

A final written or oral comprehensive examination is required in some programs. This examination will be given by the department concerned at least two weeks before the commencement at which the degree is expected.

Thesis

Theses are required in some programs and should demonstrate the individual's capacity to execute independent work based on original material.

Theses must be approved by the departmental graduate committee, and, in cases in which a grade is required, must receive a grade of B (3.0) or better to be accepted.

Students who have not completed their thesis after having registered for the specified number of thesis credits must register and pay for Master's Thesis Continuation each subsequent quarter until the thesis is complete. Master's Thesis Continuation will carry no credit but will be recorded on the students' transcripts with the appropriate grade (S or U) for each quarter of registration.

Language Requirement

An examination to show evidence of ability in one or more foreign languages is required in some graduate programs. This knowledge is established by an examination, which will be administered by the appropriate department or the office of the Graduate School at least twice yearly.

Transfer Credit

Students should petition, in writing, through their departments to the Director of the Graduate School of Arts and Sciences for all transfer credit. A copy of an official transcript should be attached to the petition. A maximum of twelve quarter hours of credit obtained at another institution may be accepted toward the master's degree, provided that the credits transferred consist of a grade of B or better in graduate-level courses, are in the candidate's field, have been earned at a recognized institution, and have not been used toward any other degree. Transfer credit grades may not be used for the purpose of obtaining the academic average necessary for completion of the degree requirements.

Time Limitation

Course credits earned in the program of graduate study or accepted by transfer are valid for a maximum of seven years, unless an extension is granted by the Director of the Graduate School of Arts and Sciences. Students should petition, in writing, through their departments to the Director of the Graduate School for such extensions.

The Doctor of Philosophy Degree

The doctor of philosophy degree is awarded to candidates who give evidence of high attainment (a minimum cumulative average of 3.000) and research ability in their major fields. Specific degree requirements are administered by a committee in charge of the degree program. This committee may be a departmental graduate committee or the committee of the Graduate School, depending upon the nature of the program. It is the responsibility of the chairperson of the committee to certify to the Graduate School office the completion of each requirement for each candidate.

Admission

Each degree program has an established admission procedure for students starting their doctoral work at Northeastern University. Please consult the appropriate departmental section for further details.

Residence Requirement	A candidate for the doctor of philosophy degree must spend the equivalent of at least one academic year in residence at the University as a full-time graduate student. The committee of each degree program specifies the method by which the residence requirement is satisfied.
Degree Candidacy	Formal degree candidacy is established when students have completed forty quarter hours of acceptable graduate work (where applicable), have passed the qualifying examination, and in all cases have been certified by the Graduate School of Arts and Sciences.
Qualifying Examination	Students must pass a qualifying examination within time limits set by the committee of each degree program.
Comprehensive Examination	Degree programs may require a comprehensive examination during the time in which a student is a degree candidate.
Course Requirements	The minimum course requirement of forty quarter hours constitutes the same work normally required for a master's degree. Course requirements beyond this minimum in each doctoral program are specified by the committee in charge of the doctoral program.
Dissertation	Each doctoral student must complete a dissertation that embodies the results of extended research and makes an original contribution to the field. This work should give evidence of the candidate's ability to carry out independent investigation and interpret in a logical manner the results of the research. The method of approval of the dissertation is established by the committee in charge of the degree program.
Language Requirement	The foreign language requirement is established by the committee in charge of each degree program.
Final Oral Examination	<p>The final oral examination will be on the subject matter of the doctoral dissertation and on important developments in the field of the dissertation. Other fields may be included if recommended by the examining committee.</p> <p>This examination will be taken after completion of all other degree requirements and must be held at least two weeks prior to the commencement at which the degree is to be awarded.</p>
Transfer Credit	Students should petition, in writing, through their departments to the Director of the Graduate School of Arts and Sciences for all transfer credit. A copy of an official transcript should be attached to the petition.

Time Limitation

After the establishment of degree candidacy, a maximum of five years will be allowed for the completion of degree requirements.

Registration

All students must register for coursework or dissertation as approved by their advisers or the departmental registration officers. After the first registration for doctoral work, registration must be continuous unless withdrawal is allowed by the committee in charge of the degree program and certified by the Graduate School of Arts and Sciences. For each quarter beyond the first three quarters that a doctoral candidate is working on the dissertation, he/she should register for Doctoral Continuation, which is listed in the course listing for each doctoral degree-granting department. Students must be registered for dissertation during the quarter in which they take the final oral examination.

Interdisciplinary Programs

Some graduate students may wish to pursue doctoral programs that involve substantial work in two or more departments. To meet this need, an interdisciplinary program may be established that corresponds in scope and depth to doctoral standards but does not agree exactly with the individual departmental regulations. For such possibilities, the option discussed below is available.

Admission

Application for admission to interdisciplinary doctoral study consists of the submission of a carefully thought out written proposal describing the areas of proposed study and research, as well as the qualifying and comprehensive examination system to be used. The proposal may be a part of the initial application for admission to graduate study at Northeastern University, or it may be submitted by a graduate student already enrolled. In either case, the admission materials should be prepared in consultation with an academic adviser. The proposal may be directed to a doctoral degree-granting department or to the Director of the Graduate School, who forwards it to the appropriate department. In either case, admission to interdisciplinary doctoral study requires favorable recommendation by the sponsoring doctoral degree-granting department and approval by authorized representatives of the graduate study committees of the departments appropriate to the disciplines covered by the applicant's proposal. The sponsoring department becomes the student's registration base.

Formation of Interdisciplinary Committee

A student who has been accepted for interdisciplinary study must obtain the consent of an adviser who will direct the doctoral dissertation. This adviser, who may or may not be a member of the registration department, will be chairperson of the interdisciplinary committee for this student. A second member will be appointed from the registration department by its chairperson. These two members will obtain one or more additional members or request the Director of the Graduate School to do so. At least two departments must be represented on the committee, and a majority of the committee must come from doctoral degree-granting departments. The chairperson of the registration department will notify the Director of the Graduate School of the membership of the committees as soon as arrangements are complete.

Duties of Interdisciplinary Committee

A member of the interdisciplinary committee who is also a member of the registration department will serve as the registration officer to approve the course registration for the student. A copy of the approved course registration must also be filed with the other committee members and with the graduate study committee of the registration department.

The interdisciplinary committee will be responsible for the administration of the qualifying examination, language examination, and comprehensive examination and approval of the dissertation. This committee must also certify to the registration department the completion of the requirements for the award of the doctoral degree. The interdisciplinary committee is also responsible for a periodic report to the registration department concerning the student's progress and must attain approval from that department for any changes in the approved program.

The interdisciplinary committee must assure that the student's program represents standards comparable to those of the registration department and that the program is not so broad as to have inadequate depth in any area.

The student's program may be reviewed at any time by the Director of the Graduate School to determine whether objectives of the program are being met.



Fields of Study

The departmental sections that follow describe the program offerings and degree requirements. Additionally, a list of courses available to a student during the typical period of attendance required to obtain a degree is provided. Quarterly listings of course offerings are published by the Graduate School Office.

Biology

The primary objective of the graduate program in biology is to enable the student to acquire a fundamental orientation in biology and to achieve some level of mastery of a chosen area of specialization. Students who reach this objective should be prepared to formulate and solve problems of fundamental importance to biology.

Professors

David C. Wharton, PhD, *Pennsylvania State University*,
Chairperson

Francis D. Crisley, PhD, *University of Pittsburgh*

Janis Z. Gabliks, DDS, *Baltic University*; PhD, *Rutgers University*

Charles A. Meszoely, PhD, *Boston University*

M. Patricia Morse, PhD, *University of New Hampshire*

Nathan W. Riser, PhD, *Stanford University*

Fred A. Rosenberg, PhD, *Rutgers University*

Ernest Ruber, PhD, *Rutgers University*

Phyllis R. Strauss, PhD, *Rockefeller University*

Associate Professors

Joseph L. Ayers, Jr., PhD, *University of California, Santa Cruz*

Kostia Bergman, PhD, *California Institute of Technology*

Charles H. Ellis, Jr., PhD, *Johns Hopkins University*

Gwilym Jones, PhD, *Indiana State University*

Helen Lambert, PhD, *University of New Hampshire*

Joseph V. Pearincott, PhD, *Fordham University*

Daniel Scheirer, PhD, *Pennsylvania State University*

Kenneth P. Sebens, PhD, *University of Washington*

Henry O. Werntz, PhD, *Yale University*

Assistant Professors

John W. Bodnar, PhD, *Oregon State University*

Donald P. Cheney, PhD, *University of South Florida*

Richard L. Marsh, PhD, *University of Michigan*

Jacqueline M. Piret, PhD, *Massachusetts Institute of Technology*

Susan Powers-Lee, PhD, *University of California, Berkeley*

Cristina Reyero, PhD, *Complutense University of Madrid*

Wendy A. Smith, PhD, *Duke University*

Graduate Program

Research

This department offers programs of concentration in animal physiology, biochemistry, botany, cell biology, ecology, marine biology, microbiology, and vertebrate zoology. Research in these areas is actively pursued by departmental faculty. The department is well equipped with remodeled, air-conditioned laboratories. Other notable facilities controlled by or available for use by the department include the Electron Microscopy Center, a large greenhouse on a suburban campus, computer terminals linked to a VAX-11/780, the Marine Science and Maritime Studies Center at Nahant (with a running seawater system and a research vessel), animal and aquarium rooms, a vertebrate museum, an herbarium, controlled-environment rooms and chambers, cell culture facilities, and a wide variety of preparative and analytical instruments, such as spectrophotometers, centrifuges, ultracentrifuges, isotope counters, HPLC, an electron paramagnetic resonance spectrometer, a gas chromatograph, fluorescent microscopes, and electrophysiological devices.

Procedures for Admission

All application forms and catalogs should be requested from the Biology Department office. Requests for information about programs should be directed to the graduate coordinator. There are three programs in biology: master of science in biology (full- or part-time); master of science in health science (full- or part-time); and doctor of philosophy (full-time only).

Financial Aid

General Policies

All full-time students enrolled in the Biology Department's master's or doctoral degree programs are eligible to be considered for financial aid. As noted in the section of this catalog on financial assistance, all students who hold assistantships and research fellowships are expected to devote full time to their studies and the duties of the award.

As a general departmental policy, a master's degree student is eligible for not more than two years of financial aid, and a doctoral student is eligible for not more than three years. After the first year, reappointments are considered on the basis of academic performance, and on professor and student evaluations from the assigned classes.

Application for Financial Aid

For consideration for financial aid, eligible students of any departmental program must include in their application materials the Graduate Record Examination (GRE) scores, including the

Advanced Test Scores in Biology. Awards are made on the basis of academic record, GRE scores, consideration of the awards available, and the candidate's experience and skills for teaching or research in the various fields. *Financial aid is available on a limited basis; therefore, early application is encouraged.*

The Master of Science in Biology

The master of science in biology is a research-oriented degree that is offered on a part-time or full-time basis. The department offers concentrations in both coursework and research in areas of study that include animal physiology, biochemistry, botany, cell biology, ecology, marine biology, microbiology, and zoology.

Admission

In addition to the requirements of the Graduate School of Arts and Sciences, applicants should have a background that includes one year each of organic chemistry, physics, and mathematics, and courses equivalent to the six one-quarter courses (four quarter hours each) of the biology undergraduate core curriculum (BIO 1103–BIO 1261). Students with deficiencies should remove them during the first twenty quarter hours of graduate work.

Transcripts of academic work and three letters of recommendation are required. GRE scores, including the Advanced Test Scores in Biology, must be submitted. Admission decisions are made by the Biology Department's Graduate Committee.

Provisional and Regular Status

If a student has a less than optimum undergraduate average or low GRE scores, the student may be admitted with provisional status. Under normal circumstances a student in this category is not eligible for financial aid. A provisional student must have a B average at the end of twelve quarter hours of graduate credit. At that time the student will be given regular status (if maintaining a B average) or is terminated from the program. A regular student is expected to maintain a B average but does not necessarily come under review at the end of the twelve quarter hours and is eligible for all forms of financial aid.

Deficiencies

Deficiencies may be filled by (1) taking course equivalents in the College of Arts and Sciences; (2) taking University College (evening) courses; (3) taking equivalent undergraduate lecture-laboratory courses at another four-year institution. Neither of the latter two options will receive graduate credit; however, graduate credit may be awarded under the first option if the

courses taken are the graduate equivalent, as described in the following section.

Equivalents in University College of Arts and Sciences Courses

Arts and Sciences		University College
BIO 1211	Environmental and Population Biology	BIO 4224, BIO 4225, BIO 4226
BIO 1260	Genetics and Developmental Biology	BIO 4235, BIO 4236, BIO 4237
BIO 1261	Cell Biology	BIO 4246, BIO 4247, BIO 4248

It is strongly recommended that students take the regular Northeastern University day undergraduate courses and/or their two-quarter hour graduate credit equivalents (listed below) to remedy their deficiencies:

BIO 3510	Environmental and Population Biology	(2 QH)
BIO 3560	Genetics and Developmental Biology	(2 QH)
BIO 3561	Cell Biology	(2 QH)

Academic Requirements

Forty quarter hours of academic work are required to complete the ms in biology. Of this, twenty quarter hours must be in Biology Department graduate courses (BIO 1300, BIO 1400, BIO 3500, and BIO 3600 courses). In addition, four quarter hours of seminars (BIO 3690) and six quarter hours of research (BIO 3701–3704 ms thesis or BIO 3731–3734 ms literature dissertation) are required. Of the remaining ten quarter hours required, four quarter hours may be additional research credits (BIO 3721–3724, BIO 3701–3704, BIO 3731–3734) or all may be Biology Department graduate courses (excluding BIO 3690) or approved courses from other departments within the University. Any transfer credit is included within these ten quarter hours.

Note, in any case, that a maximum of ten quarter hours of research courses is applicable to the ms degree, which must include a minimum of six quarter hours of BIO 3701–3704 or BIO 3731–3734.

A cumulative average of 3.000 for all graduate work is required for the award of the ms degree. All regulations of the Graduate School of Arts and Sciences apply with regard to maintenance of academic standing.

Research

Either six quarter hours of ms thesis (BIO 3701–3704) or six quarter hours of ms literature dissertation (BIO 3731–3734), both of which culminate in a written report, is required for the ms in biology.

MS Thesis

The ms thesis involves a program of laboratory or field research leading to the writing and oral defense of a thesis. The candidate works under the direction of a member of the graduate

faculty and a committee of two other biology graduate faculty members.

MS Literature Dissertation

The ms literature dissertation involves a program of extensive literature research leading to a comprehensive written review of an important biological problem and an oral examination. This study is undertaken with a member of the biology graduate faculty and a committee of two other biology graduate faculty.

Master of Science in Health Sciences

The MSHS degree is offered to provide a more flexible set of options for students interested in health sciences. Students may enroll on a full- or part-time basis. The specific curriculum of studies by MSHS degree students is determined by consultation with the graduate director of the program and/or the adviser, within the general guidelines specified under Academic Requirements below.

Admission

In addition to the requirements of the Graduate School of Arts and Sciences, applicants should have a background that includes one year each of organic chemistry, physics, and mathematics, and courses equivalent to the six one-quarter courses (four quarter hours each) of the biology undergraduate core curriculum (BIO 1103–BIO 1261). Students with deficiencies should remove them during the first twenty quarter hours of graduate work. In the MSHS program, some flexibility is allowed in the way in which these deficiencies may be removed (or waived); approval must be received from the graduate coordinator of the program and the department's graduate committee.

Candidates are required to submit transcripts of academic work and three letters of recommendation.

Academic Requirements

For the MSHS, the candidate must complete forty quarter hours of academic work. Of this work, twenty quarter hours must be coursework in Biology Department graduate courses (BIO 3000 courses, excluding BIO 3690, BIO 3721–3724, BIO 3701–3704, and BIO 3731–3734). In addition, four seminars (BIO 3690) are required. Two of these seminars, with prior approval of the graduate coordinator of the program, may be graduate seminars offered by other departments in the University. The remaining sixteen quarter hours of graduate credit may be Biology Department graduate courses, up to six quarter hours



of research courses (including BIO 3711–3714), or approved courses in other departments within the University. A maximum of twelve quarter hours of transfer credit may be included within these sixteen quarter hours.

A cumulative average of 3.000 for all graduate work is required for award of the MSHS. The regulations of the Graduate School apply with regard to maintenance of academic standing.

Final Comprehensive Exam

In the final year of graduate study, the MSHS candidate must successfully complete written final comprehensive examinations in a major and minor area, unless the research option (described below) is exercised. This examination is designed to test the candidate's proficiency in the areas of study. If it is not successfully completed, one reexamination is permitted. Candidates should notify the program director six months before they intend to take the examination.

Research Option

A research option (MS thesis or literature dissertation) is available, and all rules as stated in the MS in Biology section apply. A successful oral defense of thesis or literature dissertation may substitute for the final comprehensive exam.

The Doctor of Philosophy

Admission

Only applicants who have a master's degree or its equivalent at entry may be considered for direct admission to the doctoral program. Those who do not may be considered only after admission to the master's program and after satisfactory completion of thirty quarter hours of graduate study, which must include completion of some research. All applicants must submit transcripts, three letters of reference, and GRE scores, including the Advanced Test scores in Biology. In addition, a student must have a written agreement from a graduate faculty member who will serve as the dissertation adviser.

A candidate for the MS degree may apply for direct transfer to the PhD program after having completed thirty quarter hours. In addition, the student must file a formal application for admission and successfully complete the oral PhD qualifying examination. A student who fails the qualifying examination may not transfer to the PhD program before receiving the MS degree, but such failure will have no effect on his/her status in the MS program. After completing the MS degree, such a student is eligible to apply for regular admission to the PhD program.

A PhD candidate in good standing may, after completing forty quarter hours of course and research credit with at least the re-

quired minimum cumulative average, apply to receive the MS degree without submitting a thesis.

**Residence
Requirement**

After admittance to the doctoral program, the student may satisfy the residence requirement by one year of full-time graduate work or by two years of half-time graduate work.

**Qualifying
Examination**

The qualifying examination is an oral examination intended to evaluate the student's knowledge of the basic principles inherent in the areas represented in the biology core curriculum and to ascertain the student's readiness to continue in the chosen research program. Students *must* take the qualifying examination by the end of three quarters at Northeastern University.

**Academic
Requirement**

Course requirements for PhD candidates are variable, depending upon recommendations of the major advisor and examination committees, but, in any event, a cumulative average of 3.000 for all graduate work is required.

**Teaching
Requirement**

A PhD candidate is required to spend one year as a teaching assistant in the department. If the candidate wishes this requirement to be waived, a petition must be submitted to the department's graduate committee. The petition must include evidence of equivalent teaching experience.

**Language
Requirement**

Candidates must establish evidence of their ability to read and translate biological literature in two foreign languages. The primary languages are French, German, and Russian. Students will be expected to choose from these languages for their examinations; however, another language may be substituted when there is considerable literature in the area of interest.

One of the language requirements may be fulfilled by completion of two courses in the general principles of statistics, biometry, and/or computer programming.

**PhD Comprehensive
Examination**

The comprehensive examination may be taken by the PhD candidate after passing at least one of the language requirements or its equivalent. The questions on the examination are designed to test whether the student's knowledge of concepts and methods in biology is sufficiently comprehensive and profound to predict a career of fruitful teaching and research. The examination in the major field will delineate the candidate's potential to teach advanced courses, while the minor examination will test competency to teach undergraduate courses in that field.

Dissertation

The dissertation is the most important part of the PhD degree and must be an original and independent scientific study. The dissertation adviser and student will work closely to evolve the problem and arrange for a PhD dissertation committee. The minimum number of members for a PhD committee is five. One member must be an acknowledged expert from outside the University.

Special-Student Status

Special students are not matriculated in a degree program, and acceptance as a special student is not related to admission into a departmental degree program. However, those special students who are subsequently admitted into a degree program may petition through the MSHS graduate coordinator to the Director of the Graduate School to apply the *first twelve* quarter hours of graduate credit earned as a special student toward degree requirements. Special students are expected to maintain a cumulative average of 3.000 in the first twelve quarter hours of study. The MSHS graduate director is the overseer for special students.

Further information on admission procedures and standards can be obtained from the Graduate School of Arts and Sciences or the MSHS graduate coordinator.

Interdisciplinary Programs

Admission

Application and credentials for admission to interdisciplinary programs involving the Biology Department, where this department is clearly the department of registration, (see general section on interdisciplinary programs) should be submitted as described under Admission: The Doctor of Philosophy for biology. The interdisciplinary committee will consist of at least five members. The composition of this committee will be determined by mutual consent of the departments involved, but, if the dissertation advisor is in the Biology Department, at least three members will be from this department. Upon admission, suitable interdisciplinary course requirements will be determined by the dissertation committee.

Qualifying Examination

Students accepted into the program will normally be expected to complete the qualifying examination by the end of three quarters at Northeastern University. At least five areas of study

will be covered by the qualifying examination, which must include at least three oral examinations chosen by the candidate from the following areas: biochemistry, botany, ecology, genetics, microbiology, physiology, and zoology. The remaining components of the examination will be specified and evaluated by the other participating department. With the exceptions of the procedures for admission and examinations for qualification, the remaining requirements and procedures are as specified under The Doctor of Philosophy for biology.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Most undergraduate biology courses in the series designated BIO 1300–1400 are available for graduate credit with adviser approval. Please consult the undergraduate or other appropriate bulletin for course details. The following courses are so considered:

Course No.	Course Name	Credit
BIO 1311	Evolution	4 QH
BIO 1320	General Microbiology	5 QH
BIO 1328	The Microbial World	4 QH
BIO 1329	Marine & Fresh Water Microbiology I	2 QH
BIO 1330	Marine Botany	4 QH
BIO 1341	Vertebrate Zoology	4 QH
BIO 1347	Embryology	5 QH
BIO 1348	Animal Histology	4 QH
BIO 1351	Comparative Vertebrate Anatomy	5 QH
BIO 1370	Marine Invertebrate Zoology	5 QH
BIO 1401	Histological Technique	3 QH
BIO 1402	Principles of Systematics	2 QH
BIO 1411	Tropical Terrestrial Ecosystems	3 QH
BIO 1420	Microbial Physiology	4 QH
BIO 1460	Current Concepts in Cell Biology	4 QH
BIO 1465	Introductory Immunology	3 QH
BIO 1466	Introductory Immunology Laboratory	2 QH
BIO 1470	Coastal Biology I	4 QH
BIO 1471	Coastal Biology II	4 QH
BIO 1472	Coastal Biology III	4 QH
BIO 1477	Biology of Corals	5 QH
BIO 1478	Biology of Fishes	5 QH
BIO 1479	Adaptations of Aquatic Organisms	4 QH
BIO 1258	Vertebrate Physiology 1	4 QH
BIO 1259	Vertebrate Physiology 2	4 QH
BIO 1421	Medical Virology	3 QH
BIO 1422	Medical Virology Laboratory	2 QH
BIO 1427	Medical Microbiology	3 QH
BIO 1428	Medical Microbiology Laboratory	2 QH
BIO 1429	Marine & Fresh Water Microbiology II	2 QH

Course No.	Course Name	Credit
BIO 1430	Introduction to Plant Physiology	4 QH
BIO 1431	Lower Plants	4 QH
BIO 1432	Higher Plants	4 QH
BIO 1437	Structural Botany	4 QH
BIO 1438	Flora of New England	4 QH
BIO 1439	Economic Botany	4 QH
BIO 1440	Advanced Invertebrate Zoology	4 QH
BIO 1441	Parasitology	4 QH
BIO 1442	Vertebrate Paleontology	4 QH
BIO 1447	Herpetology	4 QH
BIO 1448	Mammalogy	5 QH
BIO 1451	Comparative Animal Physiology	4 QH
BIO 1452	Comparative Neurobiology	4 QH

The following are graduate courses:

BIO 3509	Principles of Systematics	2 QH
BIO 3510	Environmental & Population Biology	2 QH
BIO 3511	Aquatic Ecology	3 QH
BIO 3512	River Ecology Laboratory	3 QH
BIO 3517	Lake Ecology Laboratory	3 QH
BIO 3518	Ecology of Salt Marshes	3 QH
BIO 3519	Ecology of Rocky Shores	4 QH
BIO 3520	Environmental Microbiology	4 QH
BIO 3521	Food Microbiology	3 QH
BIO 3522	Food Microbiology Laboratory	2 QH
BIO 3527	Animal Virology	3 QH
BIO 3528	Animal Virology Laboratory	2 QH
BIO 3530	Plant Nutrition & Metabolism	4 QH
BIO 3531	Plant Growth & Reproduction	4 QH
BIO 3547	Biomechanics I, Theory	4 QH
BIO 3548	Biomechanics II, Application	4 QH
BIO 3549	The Physiology and Biomechanics of Animal Activity	4 QH
BIO 3550	Cardiovascular Physiology	3 QH
BIO 3551	Cardiovascular Physiology Laboratory	1 QH
BIO 3552	Osmotic & Ionic Regulation	2 QH
BIO 3558	Vertebrate Endocrinology	3 QH
BIO 3559	Animal Nutrition	2 QH
BIO 3560	Genetics & Developmental Biology	2 QH
BIO 3561	Cell Physiology & Biochemistry	2 QH
BIO 3562	General Biochemistry	3 QH
BIO 3567	General Biochemistry Laboratory	3 QH
BIO 3569	Microbial Genetics	3 QH
BIO 3572	Biology of Meiofauna	2 QH
BIO 3577	Malacology	4 QH
BIO 3601	Biological Electron Microscopy	4 QH
BIO 3607	Advanced Developmental Biology	3 QH
BIO 3608	Advanced Developmental Biology Laboratory	2 QH
BIO 3609	Cellular Aspects of Development	3 QH
BIO 3610	Human Ecology	4 QH
BIO 3617	Environmental Law	2 QH
BIO 3620	Industrial Microbiology	3 QH
BIO 3621	Industrial Microbiology Laboratory	2 QH
BIO 3652	Comparative Neurobiology	3 QH
BIO 3657	Neurophysiology Laboratory	2 QH
BIO 3661	Human Genetics	3 QH
BIO 3667	Biochemistry Laboratory Rotation I	3 QH
BIO 3668	Biochemistry Laboratory Rotation II	3 QH
BIO 3669	Biochemistry Laboratory Rotation III	3 QH

Course No.	Course Name	Credit
BIO 3670	Developmental Biology of Marine Invertebrates	5 QH
BIO 3672	Ichthyology	4 QH
BIO 3690	Graduate Seminar	1 QH
BIO 3721	Special Topics in Biology	1 QH
BIO 3722	Special Topics in Biology	2 QH
BIO 3723	Special Topics in Biology	3 QH
BIO 3724	Special Topics in Biology	4 QH
BIO 3711	Special Investigation in Biology	1 QH
BIO 3712	Special Investigation in Biology	2 QH
BIO 3713	Special Investigation in Biology	3 QH
BIO 3714	Special Investigation in Biology	4 QH
BIO 3701	MS Thesis	1 QH
BIO 3702	MS Thesis	2 QH
BIO 3703	MS Thesis	3 QH
BIO 3704	MS Thesis	4 QH
BIO 3731	MS Literature Dissertation	1 QH
BIO 3732	MS Literature Dissertation	2 QH
BIO 3733	MS Literature Dissertation	3 QH
BIO 3734	MS Literature Dissertation	4 QH
BIO 3741	PhD Dissertation	1 QH
BIO 3742	PhD Dissertation	2 QH
BIO 3743	PhD Dissertation	3 QH
BIO 3744	PhD Dissertation	4 QH
BIO 3798	Master's Thesis Continuation	0 QH
BIO 3799	Doctoral Dissertation Continuation	0 QH

Chemistry

The Chemistry Department offers programs leading to the MS and PhD degrees. The requirements for the MS degree may be met either via a part-time program involving only coursework (non-thesis) or via a full-time program involving coursework plus a research thesis (thesis). Proposals to obtain the master's degree on bases varying from these must be approved by the department. The PhD requires a program of coursework plus a PhD research thesis. The department's areas of concentration are in analytical, inorganic, organic, and physical chemistry. There are well-funded theoretical and experimental research programs in all of these areas, under the direction of individual faculty members.

The MS and PhD degrees prepare candidates for research, administration, and managerial work in science and technology in industrial, governmental, and academic institutions. A key feature of the department's research philosophy is the importance placed on individual interactions between faculty research directors and students in the research groups. The department's teaching at the graduate level is characterized by constant application of and reference to the primary literature in chemistry, physics, biology, and ancillary fields.

Professors

Philip W. LeQuesne, PhD, *University of Auckland, Chairperson*

Geoffrey Davies, PhD, *Birmingham University*

Bill C. Giessen, Dr Sci Nat, *University of Gottingen*

Arthur M. Halpern, PhD, *Northeastern University*

Barry L. Karger, PhD, *Cornell University*

William M. Reiff, PhD, *Syracuse University*

John L. Roebber, PhD, *University of California, Berkeley, Executive Officer*

Robert A. Shepard, PhD, *Yale University*

Alfred Viola, PhD, *University of Maryland*

Paul Vouros, PhD, *Massachusetts Institute of Technology*

Professors Jointly Appointed

John L. Neumeyer, PhD, *University of Wisconsin (College of Pharmacy and Allied Health Professions)*

Robert F. Raffauf, PhD, *University of Minnesota (College of Pharmacy and Allied Health Professions)*

Associate Professors

David A. Forsyth, PhD, *University of California, Berkeley*

David M. Howell, PhD, *University of Michigan*

Conrad M. Jankowski, PhD, *State University of Iowa*

Elmer E. Jones, PhD, *Washington University*

Kay D. Onan, PhD, *Duke University*

Robert N. Wiener, PhD, *University of Pennsylvania*

Assistant Professors

Lee A. Flippin, PhD, *Colorado University*

Thomas R. Gilbert, PhD, *Massachusetts Institute of Technology*

Michael E. Kellman, PhD, *University of Chicago*

Mary J. Ondrechen, PhD, *Northwestern University*

John A. Wronka, PhD, *University of Delaware*

Lawrence D. Ziegler, PhD, *Cornell University*

Research

In the analytical area, the chief focuses are on separation science, mass spectroscopy, and trace element analysis. In separation science, HPLC theory and practice, separation of chiral solutes, studies on proteins, peptides, forensic analysis, and development of methodologies are major thrusts. In mass spectroscopy, combined HPLC/MS and GC-MS technology, MS/MS methodology, and studies of oxidation of steroid hormones by these techniques are current emphases. Trace element analysis methods are developed for materials such as industrial wastes, petroleum, liquefied coal products, and biological and environmental samples. Fundamental studies in plasma emission spectroscopy are also under way.

In the inorganic area, the solid-state research group emphasizes synthesis, the structures and properties of amorphous and glassy metals, and the catalytic properties of amorphous metals and alloys. The Mössbauer spectroscopy of a variety of metallic elements and their compounds is being studied. There are programs on catalytic oxygenation involving transition metal complexes, including stabilization of air-sensitive liquefied coals.

In organic chemistry, the physical organic group is concerned with isotope effects and nuclear magnetic resonance (NMR) spectroscopy as tools to investigate reactive intermediates and also with mechanisms of pericyclic reactions. The synthetic-natural products area has groups working on the isolation, structural determination, and synthesis of bioactive natural products and on the design of synthetic methodology appropriate for a wide variety of applications.

Molecular structures and conformation of organic and inorganic compounds are studied by x-ray crystallography.

The physical chemistry group has experimental interests concentrated in the areas of spectroscopy, photochemistry, and photophysics. In the theoretical area, interest is centered on the theory of electron transfer and on the modeling of excited atomic and molecular states, using group theoretical techniques.

Admission

In addition to the admission requirements listed on page 19, an applicant must have completed a full year of undergraduate organic chemistry, physical chemistry, analytical chemistry, calculus, and physics. Admission policy favors those who have taken courses beyond the above minimum.

These admission requirements may be modified to accommodate applicants who have taken fewer courses than indicated above but who have outstanding records and a strong interest in chemical or interdisciplinary studies. See also the description of interdisciplinary programs.

Program Planning

Prospective students and current students should discuss their programs with a departmental adviser. The departmental advisers may be reached by calling 437-2822 and would welcome discussion of curriculum matters and program planning.

The Master of Science Degree

Thesis Program

This program may only be pursued on a full-time basis while in residence except when special departmental approval has been obtained. It consists of a minimum of forty quarter hours of graduate credit in courses, seminars, and research and a thesis based on this research. Each student is required to take at least twenty-four quarter hours of credit in graduate chemistry courses numbered between CHM 3521 and CHM 3699. Up to four quarter hours of graduate courses in physics or mathematics may be substituted. At least eight of these courses must be taken in the first year of residence, with a minimum quality point average of 2.50 in the best eight courses taken in order to continue in the program. (For students who wish to be considered for the PhD degree, a quality point average of 3.0, in these eight courses is required, and no more than five of these courses may be in any one area of concentration.) A cumulative average of 3.0 is required in all courses that have a CHM prefix and in the graduate courses in physics and mathematics that are included in the minimum. In agreement with general Grad-

uate School regulations, a cumulative average of 3.000 is required for the entire program, and two courses or six quarter hours of credit, whichever is greater, may be repeated.

The student's program must include four quarter hours of credit in each of three out of the four areas of chemistry, selected from the following core courses:

- Four quarter hours of credit in analytical chemistry, chosen from CHM 3521, CHM 3523, CHM 3525, and CHM 3527.
- Four quarter hours of credit in inorganic chemistry, normally in the CHM 3541 and CHM 3542 sequence.
- Four quarter hours of credit in organic chemistry, normally in the CHM 3561 and CHM 3562 sequence.
- Four quarter hours of credit in physical chemistry, in either the CHM 3581 and CHM 3582 sequence *or* the CHM 3591 and CHM 3592 sequence. Note that CHM 3581 and CHM 3591 by themselves are not sufficient.

In cases of unusual preparation, more advanced courses may be substituted within the given subdiscipline. Approval for any substitution should be obtained from the departmental graduate academic standing committee before any such courses are taken.

A minimum of six quarter hours of credit, but no more than fourteen, may be assigned to CHM 3810, Research and Thesis for ms degree. Each student is required to attend the appropriate section of seminar (CHM 3800, CHM 3801, CHM 3802, CHM 3803) in each quarter of residence and is expected to conduct one seminar in each academic year of residence, for which one quarter hour of credit is assigned, up to the maximum of two quarter hours of credit.

Students in the thesis program are eligible to apply for financial support through the Department of Chemistry.

Nonthesis Program

This program may be pursued on a part-time basis. It consists of forty quarter hours of credit in graduate coursework, of which a minimum of thirty-two quarter hours of credit must be taken in chemistry graduate courses numbered between CHM 3521 and CHM 3699. The remainder of the program consists of any graduate courses for which the student has the necessary prerequisites. Only those graduate courses that constitute the first forty quarter hours of credit will be considered by the department. In agreement with general Graduate School regulations, two courses or six quarter hours of credit, whichever is greater, may be repeated, and a cumulative average of 3.0 is required.

The student's program must include the following core courses in the four areas of chemistry:

- Four quarter hours of credit in analytical chemistry, chosen from CHM 3521, CHM 3523, CHM 3525, and CHM 3527.
- Four quarter hours of credit in inorganic chemistry, normally in the CHM 3541 and CHM 3542 sequence.
- Four quarter hours of credit in organic chemistry, normally in the CHM 3561 and CHM 3562 sequence.
- Four quarter hours of credit in physical chemistry, in either the CHM 3581 and CHM 3582 sequence *or* the CHM 3591 and CHM 3592 sequence. Note that CHM 3581 and CHM 3591 by themselves are not sufficient.

In cases of unusual preparation, more advanced courses may be substituted within the given subdiscipline. Approval for any substitution should be obtained from the departmental graduate academic standing committee before any such courses are taken.

Students in the nonthesis program are not eligible for financial support through the Department of Chemistry.

Doctor of Philosophy Degree

The doctoral program in chemistry may be pursued only in residence. The additional requirements beyond those of the master's degree are designed to provide the doctoral candidate an opportunity to demonstrate superior proficiency in original research, including technical reading ability in a foreign language and familiarity with current advances in one of the main areas of chemistry.

Residence Requirement

The residence requirement is satisfied after one year of full-time graduate work or two years of half-time work. If a student holds a teaching assistantship that occupies one half of the student's time, the residence requirement is discharged at half rate. Other arrangements require faculty approval. If a candidate has a research fellowship that supports the research for the doctoral dissertation, the residence requirement is discharged at full rate. Normally, the equivalent of two years of work after establishment of doctoral candidacy is necessary to complete research.

Degree Candidacy

Degree candidacy is established in accordance with the general Graduate School of Arts and Sciences regulations.

Qualifying Examinations

Qualifying examinations are offered in the fields of analytical, inorganic, organic, and physical chemistry. There are eight ex-

aminations offered each year in each field. Students are required to pass four of these examinations in their declared field of study.

A student is eligible to take the qualifying examination if:

1. The student has entered with a bachelor's degree and has achieved a 3.0 quality point average in eight courses taken in the first year of residence, as described in the MS Thesis Program above. *No more than five of these courses may be within any one area of concentration if the student wishes to be in the PhD program.* Two of the eight graduate courses may be in physics or mathematics; the remaining courses must be numbered between CHM 3521 and CHM 3699.
2. The student has been admitted to the doctoral program with an awarded master's degree.
3. The student is a part-time student who has petitioned the department after having completed at least sixteen quarter hours of credit in graduate courses, including fulfillment of three of the four distributional requirements listed for the part-time program. A 3.000 cumulative average is required for all courses taken.

Students in category 1 must pass the qualifying examinations by July 1 of their second year of residence. Students in category 2 must pass the qualifying examinations by July 1 of their first year of residence. Students in category 3 will have the conditions set at the time their petition is approved.

Course Requirements

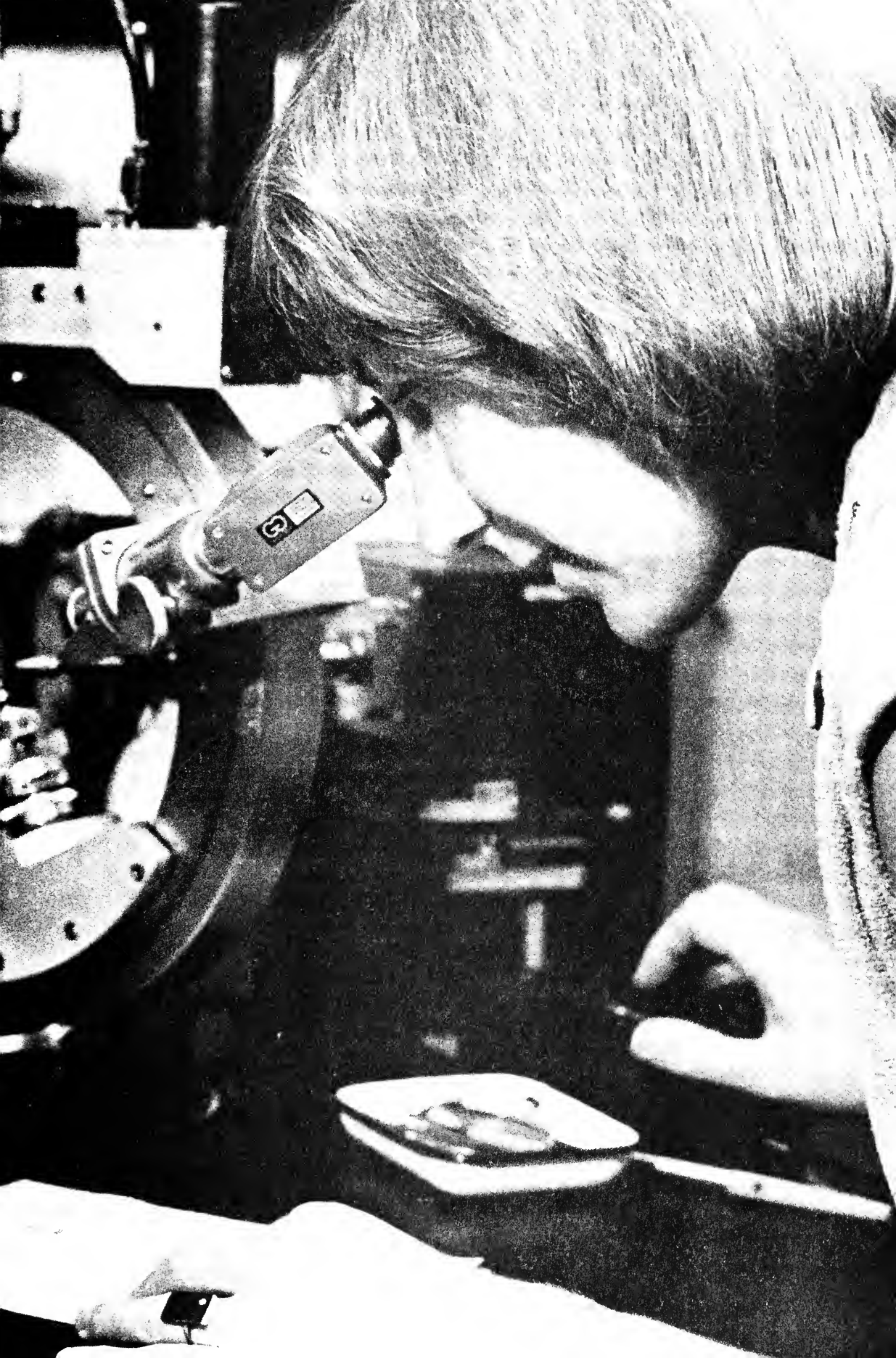
A candidate is normally required to complete some coursework beyond the forty-quarter-hour minimum. The number and nature of these courses are individually determined for each candidate in consultation with the dissertation adviser.

Dissertation

In most cases, arrangements for a dissertation adviser will have been made before the completion of the qualifying examinations. If not, such arrangements must be made as soon as possible after degree candidacy has been established. The dissertation adviser directs the research for the dissertation and serves as chairperson of the dissertation committee, which must approve the dissertation before the degree may be conferred.

Language Requirements

Candidates must demonstrate proficiency in a foreign language, as specified by the departmental graduate committee in accordance with the general Graduate School regulations. French, German, and Russian are the acceptable foreign languages. Normally, proficiency is demonstrated by taking examinations administered by the Chemistry Department.



**Final Oral
Examination**

This examination will be held in accordance with the Graduate School regulations.

Areas of Advanced Study and Research

- Analytical Chemistry** The general areas of active research in analytical chemistry include separation science; the application of analytical methods to a wide range of problems; the application of mass spectrometry to organic analytes in mixtures; and forensic, clinical, and oceanographic analysis.
- Inorganic Chemistry** Research in solid state emphasizes the synthesis and properties of amorphous metals and alloys; preparation of new catalytic materials; and Mössbauer studies of a wide variety of metal-containing species. In the solution area, catalytic properties of the coordination complexes of transition metals are a focus of activity.
- Organic Chemistry** Research in the organic chemistry division encompasses the areas of organic synthesis, synthetic methodology, organic reaction mechanisms, carbocationic species, natural products, phytochemistry, and chemical ecology.
- Physical Chemistry** The physical chemistry division has active research programs in the areas of photophysics, fluorescence spectroscopy, solution and gas phase photochemistry, molecular spectroscopy, physical solid-state chemistry including x-ray diffraction, small molecule x-ray crystallography, and theoretical studies, especially of electron transfer and of atomic and molecular excited states.
- Research Facilities and Equipment** The main facilities of the department are located in Hurtig Hall. Substantial additional space and equipment are available in the Barnett Institute of Chemical Analysis and Materials Science in Mugar Hall; in the Forsyth Building; and at the University's Marine Science and Maritime Studies Center at Nahant. Major research equipment includes:
- Electron spin, nuclear magnetic resonance, and mass spectrometers
 - Liquid and gas chromatographs and atomic absorption spectrometers
 - X-ray diffractometers, an electron microscope, and thermal analyzers and calorimeters
 - Gouy and Faraday magnetic balances and a vibrating sample magnetometer

- Vacuum ultraviolet, photoionization, ultraviolet, visible, and infrared spectrometers
- Flash photolysis, laser photolysis, and photochemical equipment
- Mössbauer spectrometers and low temperature facilities
- Fluorescence emission and lifetime apparatus and a stopped-flow apparatus
- Electroanalytical, polarographic, and coulometric equipment

INTERDISCIPLINARY GRADUATE CHEMISTRY PROGRAMS

Some graduate students wish to pursue doctoral programs that involve substantial work in two or more departments. The Chemistry Department has served as the registration department for a number of students engaged in such areas. The details of establishing such a program tailored to a student's individual needs are explained on page 29 of this catalog.

Master of Science in Clinical Chemistry

A part-time interdisciplinary program offered in cooperation with the College of Pharmacy and Allied Health Professions, the master of science in clinical chemistry program is designed to help prepare students for employment in clinical laboratories. Students must apply for this program through the College of Pharmacy and Allied Health Professions. Details are given below.

Master of Science in Clinical Chemistry (Part-Time Program)

Admission

In addition to the admissions requirements listed on page 19, the applicant must have completed a baccalaureate program in biology, chemistry, medical technology, or pharmacy. Undergraduate requirements to have been completed for this program are a minimum of two quarters of organic chemistry and two quarters of analytical chemistry (each with a laboratory or its equivalent), two quarters of human physiology, and two quarters of physical chemistry. An individual who has deficiencies in any of these areas may take appropriate evening courses (for undergraduate credit only) at Northeastern University concurrently with those graduate courses that do not require the deficient prerequisites. The appropriate evening

courses offered at University College of Northeastern University are Analytical Chemistry (ICHM 4221–ICHM 4223 or ICHM 4224); Organic Chemistry (ICHM 4261–ICHM 4263); Physical Chemistry (ICHM 4381–ICHM 4383); and Human Anatomy and Physiology (IBIO 4175–IBIO 4177). Equivalent courses from this University or other universities will be accepted.

This is an interdisciplinary program. Applications should be directed to the Graduate School of Pharmacy and Allied Health Professions.

Program

The master of science in clinical chemistry program is interdisciplinary, offered in cooperation with Northeastern's College of Pharmacy and Allied Health Professions. Forty quarter hours of academic coursework is required. In addition, students must have at least one year of acceptable clinical laboratory experience prior to completion of academic degree requirements. Students in good standing in the program who lack the required experience may apply for the course FMLS 1552, Clinical Chemistry Applied Study, which carries five quarter hours of undergraduate credit, two of which may be applied toward the master's degree. This course is offered through the College of Pharmacy and Allied Health Professions at one of the nearby affiliated hospitals, providing students the opportunity to earn three months' experience in a clinical setting. Students should consult the Medical Laboratory Science (MLS) Clinical Coordinator regarding prerequisite courses and the details for taking this course, which must be arranged at least six months in advance of enrollment in the course. Individuals who have completed this course may then be able to obtain subsequent employment in this field and thereby satisfy the one year's experience requirement.

The program is available on a part-time basis, with courses offered primarily during the evening hours. Courses are scheduled in the fall, winter, spring, and summer quarters. The following core courses are required in the program:

Course No.	Course Name	Credit
CMTH 3221	Biostatistics	2 QH
CCHM 3430	Modern Methods of Analysis	3 QH
CCHM 3521	Analytical Separations	2 QH
FPMC 3301	Clinical Chemistry I	2 QH
FPMC 3302	Clinical Chemistry II	2 QH
FPMC 3651	Seminar and Report in Clinical Chemistry I	2 QH
FRSC 3301	Radioisotopes in Biological Systems	2 QH
FMLS 3301	Functions of Human Systems	2 QH
FINT 3101	Biochemistry I	2 QH
CINT 3102	Biochemistry II	2 QH
FINT 3103	Biochemistry III	2 QH
		<hr/>
		23 QH

Twelve additional quarter hours of credit must be taken from the following elective core courses:

Course No.	Course Name	Credit
CCHM 3523	Electroanalytical Chemistry	2 QH
CCHM 3531	Special Topics in Analytical Chemistry I	2 QH
CCHM 3532	Special Topics in Analytical Chemistry II	2 QH
CCHM 3528	Computers in Chemistry	3 QH
CBIO 3561	Human Genetics	2 QH
FPMC 3652	Seminar and Report in Clinical Chemistry II	2 QH
FPMC 3653	Seminar and Report in Clinical Chemistry III	2 QH
FPMC 3101	Advanced Medicinal Chemistry I	2 QH
FPMC 3102	Advanced Medicinal Chemistry II	2 QH
FPMC 3103	Advanced Medicinal Chemistry III	2 QH
FPMC 3104	Advanced Medicinal Chemistry IV	2 QH
FPCL 3101	Concepts in Pharmacology I	2 QH
FPCL 3102	Concepts in Pharmacology II	2 QH
FTOX 3101	Concepts in Toxicology I	2 QH
FPCL 3161	Drug Metabolism	2 QH
FMLS 3302	Pathophysiology I	2 QH
FMLS 3303	Pathophysiology II	2 QH
FMLS 3365	Medical Laboratory Management I	2 QH
FMLS 3366	Medical Laboratory Management II	2 QH
FMLS 3321	Hematology I—Disorders of the Erythrocytes	2 QH
FMLS 3338	Immunobiology	2 QH
FMLS 3322	Hematology II—Disorders of the Leukocytes	2 QH
FMLS 3304	Cellular Pathology I	2 QH
FMLS 3305	Cellular Pathology II	2 QH
FMLS 3341	Advanced Clinical Microbiology I	2 QH
FMLS 3342	Advanced Clinical Microbiology II	2 QH
FMLS 3601	MLS Seminar: Clinical Chemistry, Hematology, Immunology, Management, Microbiology	4 QH
FINT 3201	Applications of Mass Spectrometry	2 QH

Selection of the remaining five quarter hours may be made from the above courses, as well as from the following and other appropriate courses in the Graduate School of Pharmacy and Allied Health Professions or in the rest of the University, with the approval of the director of the MS program in clinical chemistry.

Course No.	Course Name	Credit
CPHY 3401	Radiation Physics	2 QH
CPHY 3402	Radiobiology	2 QH
CCHM 3541	Inorganic Chemistry I	2 QH
CCHM 3542	Inorganic Chemistry II	2 QH
CCHM 3641	Coordination Chemistry	2 QH
CCHM 3561	Advanced Organic Chemistry I	2 QH
CCHM 3562	Advanced Organic Chemistry II	2 QH
CCHM 3563	Physical Organic Chemistry	2 QH
CCHM 3564	Spectrometric Identification of Compounds	2 QH
CCHM 3581	Thermodynamics I	2 QH
CCHM 3591	Atomic and Molecular Structure I	2 QH
CCHM 3594	Kinetics	2 QH
CBIO 1461	Serology-Immunology	3 QH
CBIO 3235	Genetics and Developmental Biology	2 QH
CBIO 3552	Comparative Physiology of Regulatory Mechanisms	2 QH
CBIO 3558	Vertebrate Endocrinology	3 QH

Course No.	Course Name	Credit
CBIO 3557	Procedures in Endocrinology	3 QH
CBIO 3560	Cell Biophysics and Biochemistry	5 QH
CBIO 3527	Virology	4 QH
CBIO 3569	Microbial Genetics	3 QH
CBIO 3627	Industrial Microbiology	3 QH
CBIO 3567	Microbial Biochemistry	4 QH
FRSC 3101	Nuclear Medicine I	2 QH
FRSC 3102	Nuclear Medicine II	2 QH
FRSC 3103	Nuclear Medicine III	2 QH
FRSC 3104	Nuclear Medicine IV	2 QH
FRSC 3601	Seminar and Research Report in Radiopharmaceutical Science	2 QH
FPMC 3141	Special Topics in Medicinal Chemistry	2 QH
FPMC 3161	Phytochemistry	2 QH
FPMC 3601	Medicinal Chemistry Seminar	2 QH
FTOX 3102	Concepts in Toxicology II	2 QH
FPCL 3111	Special Topics in Pharmacology	2 QH
FTOX 3121	Environmental Toxicology	2 QH
FPCL 3131	Receptor Pharmacology	2 QH
FMLS 3323	Hematology III—Coagulation	2 QH
FMLS 3343	Advanced Clinical Microbiology III	2 QH

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
CHM 3231	Remedial Analytical Chemistry	1 QH
CHM 3271	Remedial Organic Chemistry I	1 QH
CHM 3272	Remedial Organic Chemistry II	1 QH
CHM 3273	Remedial Organic Chemistry III	1 QH
CHM 3381	Remedial Physical Chemistry I	1 QH
CHM 3382	Remedial Physical Chemistry II	1 QH
CHM 3383	Remedial Physical Chemistry III	1 QH
CHM 3401	Special Topics in Chemistry: Chemistry and Society I	2 QH
CHM 3402	Special Topics in Chemistry: Chemistry and Society II	2 QH
CHM 3403	Special Topics in Chemistry: Chemistry and Society III	2 QH
CHM 3420	Modern Methods of Analysis	2 QH
CHM 3430	Modern Methods of Analysis/Laboratory	3 QH
CHM 3431	Remedial Instrumental Analysis	1 QH
CHM 3441	Remedial Inorganic Chemistry	1 QH
CHM 3461	Remedial Identification of Organic Compounds	1 QH
CHM 3501	Polymer Chemistry I	2 QH
CHM 3502	Polymer Chemistry II	2 QH
CHM 3503	Polymer Chemistry III	2 QH
CHM 3510	Special Projects in Chemistry	2 QH
CHM 3521	Analytical Separations	2 QH
CHM 3522	Advanced Analytical Separations	2 QH
CHM 3523	Electroanalytical Chemistry I	2 QH
CHM 3524	Electroanalytical Chemistry II	2 QH
CHM 3525	Optical Methods of Analysis I	2 QH
CHM 3526	Optical Methods of Analysis II	2 QH
CHM 3527	Analytical & Organic Mass Spectrometry	2 QH

Course No.	Course Name	Credit
CHM 3528	Computers in Chemistry	3 QH
CHM 3529	Chemical Instrumentation I: Measurements and Control	2 QH
CHM 3530	Chemical Instrumentation II: Computer Interfacing	2 QH
CHM 3531	Special Topics in Analytical Chemistry I	2 QH
CHM 3532	Special Topics in Analytical Chemistry II	2 QH
CHM 3541	Advanced Inorganic Chemistry I	2 QH
CHM 3542	Advanced Inorganic Chemistry II	2 QH
CHM 3543	Advanced Inorganic Chemistry III	2 QH
CHM 3561	Advanced Organic Chemistry I	2 QH
CHM 3562	Advanced Organic Chemistry II	2 QH
CHM 3563	Physical Organic Chemistry	2 QH
CHM 3564	Spectrometric Identification of Organic Compounds	2 QH
CHM 3581	Chemical Thermodynamics I	2 QH
CHM 3582	Chemical Thermodynamics II	2 QH
CHM 3583	Chemical Thermodynamics III	2 QH
CHM 3591	Introductory Quantum Chemistry I	2 QH
CHM 3592	Introductory Quantum Chemistry II	2 QH
CHM 3593	Introductory Quantum Chemistry III	2 QH
CHM 3594	Chemical Kinetics	2 QH
CHM 3641	Coordination Chemistry	2 QH
CHM 3642	Special Topics in Inorganic Chemistry I	2 QH
CHM 3643	Special Topics in Inorganic Chemistry II	2 QH
CHM 3644	Special Topics in Inorganic Chemistry III	2 QH
CHM 3645	Special Topics in Inorganic Chemistry IV	2 QH
CHM 3661	Organic Stereochemistry and Reaction Mechanisms I	2 QH
CHM 3662	Organic Stereochemistry and Reaction Mechanisms II	2 QH
CHM 3663	Organic Reaction Mechanisms & Organic Synthesis I	2 QH
CHM 3664	Organic Reaction Mechanisms & Organic Synthesis II	2 QH
CHM 3671	Special Topics in Organic Chemistry I	2 QH
CHM 3672	Special Topics in Organic Chemistry II	2 QH
CHM 3673	Special Topics in Organic Chemistry III	2 QH
CHM 3681	Special Topics in Physical Chemistry I	2 QH
CHM 3682	Special Topics in Physical Chemistry II	2 QH
CHM 3683	Special Topics in Physical Chemistry III	2 QH
CHM 3800	Analytical Seminar	1 QH
CHM 3801	Inorganic Seminar	1 QH
CHM 3802	Organic Seminar	1 QH
CHM 3803	Physical Seminar	1 QH
CHM 3810	Research for MS	6 QH
CHM 3820	Research & Dissertation for PhD	0 QH
CHM 3798	Master's Thesis Continuation	0 QH
CHM 3799	Doctoral Dissertation Continuation	0 QH

Economics

Economics studies how societies produce and distribute goods and services and how income and wealth are distributed. Economists develop techniques that help identify and analyze society's problems and recommend alternative solutions, when needed. The relevance of economic skills is evidenced by the employment of economists in large numbers by government agencies and business firms, as well as by academic institutions.

Economics is both a theoretical and an applied social science. The Economics Department offers courses and programs that require students to apply economic theory to relevant social problems. Areas in which the department specializes include public policy and economic planning, labor economics and manpower planning, urban and regional economics, development economics, public finance and monetary theory and finance.

The Economics Department offers four programs with different admissions requirements and program form and content, in an effort to serve students with varying backgrounds, interests, and goals. These programs include a nondegree certificate program, an MS degree program in economic policy and planning, an MA degree program with specialization in one of four available fields, and a doctoral degree program.

Professors

Morris A. Horowitz, PhD, *Harvard University, Chairperson*
Conrad P. Caligaris, PhD, *Brown University*
Harold M. Goldstein, PhD, *Clark University*
Daryl A. Hellman, PhD, *Rutgers University*
Irwin L. Herrnstadt, PhD, *Massachusetts Institute of Technology*
Sungwoo Kim, PhD, *University of California, Berkeley*
Gustav Schachter, PhD, *New York University*

Associate Professors

Neil Alper, PhD, *University of Pittsburgh*
Bruce Bolnick, PhD, *Yale University*
Steven A. Morrison, PhD, *University of California, Berkeley*
Pawan K. Sawhney, PhD, *Boston University*

Andrew Sum, MA, *Massachusetts Institute of Technology*
Gregory H. Wassall, PhD, *Rutgers University*

Assistant Professors

Oscar Brookins, PhD, *State University of New York, Buffalo*
Kamran Dadkhah, PhD, *Indiana University*
Alan W. Dyer, PhD, *University of Maryland*
Barbara Fraumeni, PhD, *Boston College*
Jeanne K. Henn, PhD, *Harvard University*

Research

The primary focus of research efforts by Economics Department members is on applying economic theory to contemporary problems. Recent research projects conducted by department members have included assistance in the development of small enterprises in Indonesia; development of a multi-regional input-output model of Italy; determination of factors affecting the choice of bus versus other intercity transportation media; evaluation of the effectiveness of federally funded employment and training programs; and estimation of factors that lead to financial success for artists.

Research in the department is facilitated by the department's own library, housing a collection of over 1,300 reference books and journals, and by the existence of several research centers within the department. Specifically, the Center for European Economic Studies, the Center for Labor Market Studies, the Center for Medical Manpower Studies, and the Center for Urban and Regional Economic Studies are all headquartered within the Economics Department. Also, computer hardware and software facilities are readily available, with six live terminals connected to the University computer for research use.

Economics faculty are active in disseminating the results of their research. Articles authored by economics faculty have appeared in virtually every major journal in the field.

Certificate Program

The Economics Department offers a nondegree program in the economics of manpower and development planning. Upon completion of the prescribed program, students will receive a certificate issued by the Graduate School of Arts and Sciences. The program is designed for students who are interested in a specialized program of courses in manpower and development planning but who do not wish to meet the requirements of a degree program.

Admission

Admission to the program will be considered for graduates of recognized universities or institutes of technology, although practical experience in manpower planning or development planning may be substituted for the admission requirements at the discretion of the faculty. All international students must submit a Test of English as a Foreign Language (TOEFL) test score or an equivalent certification of proficiency in English with the application and academic transcripts.

Program

This certificate program is designed to be completed in one year. Students admitted to the program may not transfer into the regular degree programs. Evidence of completion of a course and of the program will be attendance and performance of all required reading and all written work. Successful completion of a course will be noted by a pass designation.

Fall Quarter (All four courses required)

- ECN 3110 Introduction to Microeconomic Theory
- ECN 3120 Introduction to Macroeconomic Theory
- ECN 3350 Labor Economics
- ECN 3370 Economic Development

Winter Quarter (Select any two of three electives listed)

- ECN 3140 Introduction to Statistics (Required)
- ECN 3352 Economics of Manpower Planning I (Elective)
- ECN 3371 Regional Development (Elective)
- ECN 3372 Comparative Economic Development (Elective)

Spring Quarter (Select any three of four courses listed)

- ECN 3353 Economics of Manpower Planning II
- ECN 3359 Seminar in Human Resource Development
- ECN 3373 Development Finance and Trade
- ECN 3379 Development Planning Seminar

Variations in this basic program are possible only with prior approval of the departmental graduate director.

The Master of Science Degree in Economic Policy and Planning

Forty-one quarter hours of academic work is required. The program consists of twenty-three quarter hours of required courses and eighteen quarter hours of electives. With the approval of the student's adviser, a student may select a maximum of six quarter hours from graduate courses offered by other departments. This is a terminal degree program designed mainly for working economists, government agency officials, and planners and managers in the private sector.

Admission Applicants must meet the general admissions regulations of the Graduate School of Arts and Sciences. Admission is only possible in the fall and winter quarters. Applications for admission to the fall quarter will be given consideration if received by July 31. Applications for admission to the winter quarter will be given consideration if received by October 31.

Applications for financial aid should be submitted no later than March 15. See page 16 for information on available financial aid.

Comprehensive Examination After completion of courses, a comprehensive examination is required of all students, to test their ability to apply concepts and tools in the broad field of economic policy and planning. The examination may be repeated only once.

Master's Thesis A master's thesis for a maximum of six quarter hours of credit is optional with the approval of the program adviser.

Course Requirements *Required Core Courses*

Course No.	Course Name	Credit
ECN 3110	Introduction to Microeconomic Theory	4 QH
ECN 3120	Introduction to Macroeconomic Theory	4 QH
ECN 3140	Introduction to Statistics	4 QH
ECN 3150	Microeconomic Policy and Planning Seminar	4 QH
ECN 3151	Macroeconomic Policy and Planning Seminar	4 QH
ECN 3152	Workshop in Economic Planning & Policy	3 QH

Students must receive a grade of B– or higher in all core courses. If a lower grade is received, a course meeting the core requirement must be taken or repeated (keeping in mind the Graduate School regulation that only six quarter hours or two courses, whichever is greater, may be repeated in order to satisfy requirements for the degree).

Elective Courses

A total of eighteen quarter hours of electives (twelve quarter hours of which must be economics courses) may be selected by the student in accordance with interests and needs. Electives may be concentrated in any of the available areas or may be distributed among fields to obtain a broader exposure. A maximum of six quarter hours of credit for courses taken at other institutions may be accepted if taken during the past seven years.

The Master of Arts Degree

Forty quarter hours of academic work is required. This program comprises sixteen quarter hours of required core coursework

and twenty-four quarter hours of electives, of which a minimum of twelve quarter hours must be selected from one of the economic fields listed below. The required core courses must be completed as soon as possible. With the prior approval of the graduate director, a student may select a maximum of six quarter hours from graduate courses offered by other departments or two advanced undergraduate courses in economics carrying three quarter hours of graduate credit each.

Admission

In addition to the general admissions requirements of the Graduate School of Arts and Sciences, applicants should have had a minimum of twelve semester hours of economics (or the equivalent), of which three semester hours (or the equivalent) should be statistics. Students without previous economics training may be admitted to the program but will be required to make up deficiencies in economic theory and statistics (see under Required Courses). Admission is only possible in the fall and winter Quarters. Applications for admission to the fall quarter will be given consideration if received by July 31. Applications for admission to the winter quarter will be given consideration if received by October 31.

Applications for financial aid should be submitted no later than March 15. See page 159 for information on available financial aid.

Comprehensive Examination

A comprehensive examination, which will be held in accordance with the general Graduate School regulations, must be taken by all students during the quarter in which the student completes the forty quarter hours of academic work. The examination may be repeated only once.

Master's Thesis

A master's thesis for six quarter hours of credit is optional with the approval of the graduate adviser. Approval will be granted only in those instances in which a student's previous graduate work indicates capacity for independent study.

Required Core Courses*

The following are required core courses:

		Credit
ECN 3210	Microeconomic Theory I**	4 QH
ECN 3220	Macroeconomic Theory I**	4 QH
ECN 3240	Statistical Inference***	4 QH
ECN 3241	Econometrics I	4 QH

*Students must demonstrate competence in mathematics by taking a mathematics examination given by the department during registration week prior to the start of the fall quarter. Students must pass this examination or satisfactorily complete ECN 3030, Introduction to Mathematics for Economists.

**Candidates deficient in intermediate theory may not be admitted into these core courses until they have completed ECN 3010, Introduction to Microeconomic Theory, and/or ECN 3020, Introduction to Macroeconomic Theory.

***Students may meet the prerequisite of this course by passing a statistics examination given by the department during registration week prior to the start of the fall or winter term or by satisfactory completion of ECN 3040, Introduction to Statistics.

Students may not receive more than one C grade in the core courses. If more than one C is earned, those courses must be repeated and a grade of at least a B– must be obtained (keeping in mind the Graduate School regulation that only six quarter hours or two courses, whichever is greater, may be repeated in order to satisfy requirements for the degree).

Economic Fields

Available economic fields are listed below. Under each field are stated the required field courses and the elective field courses. Students must take at least twelve quarter hours in one field of concentration. In all fields, the first listed required course in the field ordinarily should be taken first by the student majoring in the field. For students not majoring in the field, courses in the field may be taken in any sequence.

Manpower Economics

Required field courses:

- ECN 3350 Economics of the Labor Market and Labor Force I
- ECN 3352 Economics of Manpower Planning I
- ECN 3359 Seminar in Human Resource Development

Elective field courses:

- ECN 3351 Economics of the Labor Market and Labor Force II
- ECN 3353 Economics of Manpower Planning II
- ECN 3354 Economics of Medical Care & Health Manpower
- ECN 3355 Economics of Human Capital
- ECN 3356 Local Labor Market Research Methods & Problems
- ECN 3357 Human Resources Planning at State and Local Areas
- ECN 3358 Economics of Education & Training Policy

Urban/Regional Economics

Required field courses:

- ECN 3360 Regional Economics
- ECN 3363 Urban Economic Systems
- ECN 3364 Urban Economic Development

Elective field courses:

- ECN 3365 Urban Transportation Economics
- ECN 3371 Regional Development
- ECN 3383 Intergovernment Finance

Development Economics

Required field courses:

- ECN 3370 Economic Development
- ECN 3371 Regional Development
- ECN 3379 Developmental Planning Seminar

Elective field courses:

- ECN 3352 Economics of Manpower Planning I
- ECN 3360 Regional Economics
- ECN 3372 Comparative Economic Development
- ECN 3373 Developmental Finance and Trade

Public Finance

Required field courses:

- ECN 3390 Public Finance Theory I*
- ECN 3391 Public Finance Theory II
- ECN 3392 Public Policy and Finance**

Elective field courses:

- ECN 3373 Development Finance and Trade
- ECN 3379 Development Planning
- ECN 3381 Monetary Policy
- ECN 3399 Seminar in Public Finance

Economics of Money and Finance

Required field courses:

- ECN 3380 Monetary Theory
- ECN 3381 Monetary Policy
- ECN 3389 Money Credit Banking Seminar

Elective field courses:

- ECN 3373 Development Finance and Trade
- ECN 3382 Public Policy & Finance
- ECN 3383 Intergovernment Finance
- ECN 3384 Capital Markets

The Doctor of Philosophy Degree

The doctoral degree program in economics is offered in the fields of manpower, urban/regional, development, and monetary economics.

Admission

Applicants who will have a master's degree in economics or its equivalent at entry may be considered for direct admission to the doctoral program. Applicants who will not have a master's degree in economics or its equivalent at entry may apply for admission to the doctoral program but must satisfactorily complete an additional forty quarter hours of graduate work equivalent to a master's degree. Such students should submit the Graduate Record Examination (GRE) scores if available.

Admission to the doctoral program is possible only in the fall quarter. Applications for the doctoral program must be submitted no later than July 31. Applications for financial aid should be submitted no later than March 15. See page 159 for information on available financial aid.

Residence Requirement

After acceptance to the doctoral program, the student may satisfy the residence requirement by one year of full-time graduate coursework. Teaching assistants may satisfy the residence requirement by two consecutive years of half-time graduate

*Formerly ECN 3383.

**Formerly ECN 3382.

coursework. A student should expect to spend at least two academic years in full-time study (or its equivalent) in completing the requirements for the doctoral degree.

Degree Candidacy

Degree candidacy is established in accordance with the general Graduate School regulations.

Course Requirements

At least thirty-two quarter hours of graduate work beyond the master's degree is required. The required core courses are:

		<i>Credit</i>
ECN 3510	Microeconomic Theory II	4 QH
ECN 3520	Macroeconomic Theory II	4 QH
ECN 3530	Mathematics for Economists	4 QH
ECN 3540	Econometrics II	4 QH

Concentration is required in one academic field. Coursework in the field must include the doctoral seminar sequence ECN 3601 and ECN 3602. This seminar has a prerequisite of twelve quarter hours of graduate coursework in the field.

Students must maintain a 3.000 cumulative average in the four core courses plus the two doctoral seminars. In addition, an overall 3.000 cumulative average must be maintained. Not more than two courses or six quarter hours of credit, whichever is greater, may be repeated in order to satisfy the requirements for the degree. Only such repeats will be counted in calculating the cumulative average requirement. Students entering the Ph.D. program directly from the Bachelor's level are subject to the M.A. program grade requirements while taking Master's level courses.

Qualifying Examinations

Each student must pass comprehensive qualifying examinations after the completion of the required core and field courses. These examinations include: (1) a two-hour written examination in macroeconomic theory; (2) a two-hour written examination in microeconomic theory; (3) a two-hour written examination in quantitative methodology; (4) a three-hour written examination in one doctoral field; and (5) a two-hour general oral examination. No qualifying examination may be taken until all required coursework in the field tested by the examination has been completed. An examination may be repeated only once.

Doctoral Dissertation

An original doctoral dissertation is required of all students in accordance with the general Graduate School regulations and the regulations established by the department. After the successful completion of the qualifying examinations, students are expected to work with dissertation advisers, under whose guid-

ance they write the doctoral dissertation. Once a dissertation topic and committee have been chosen, the doctoral candidate must present the topic to a seminar of graduate faculty. The dissertation adviser serves as chairperson of the dissertation committee, which must approve the dissertation before the degree may be conferred.

Final Oral Examination

The final oral examination is established in accordance with the general Graduate School regulations.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
ECN 3010	Introduction to Microeconomic Theory	3 QH
ECN 3020	Introduction to Macroeconomic Theory	3 QH
ECN 3030	Introduction to Mathematics for Economists	4 QH
ECN 3040	Introduction to Statistics	0 QH
ECN 3110	Introduction to Microeconomic Theory	0 QH
ECN 3120	Introduction to Macroeconomic Theory	0 QH
ECN 3130	Introduction to Mathematics for Economists	0 QH
ECN 3140	Introduction to Statistics	4 QH
ECN 3150	Microeconomic Policy Planning Seminar	4 QH
ECN 3151	Macroeconomic Policy Planning Seminar	4 QH
ECN 3152	Workshop in Economic Planning & Policy	3 QH
ECN 3210	Microeconomic Theory I	4 QH
ECN 3220	Macroeconomic Theory I	4 QH
ECN 3240	Statistical Inference	4 QH
ECN 3241	Econometrics I	4 QH
ECN 3310	Case Studies in Applied Microeconomics	3 QH
ECN 3330	Economic Programming	3 QH
ECN 3331	Accounting for Economists	3 QH
ECN 3332	Computers in Economic Research	3 QH
ECN 3350	Economics of the Labor Market and Labor Force I	3 QH
ECN 3351	Economics of the Labor Market and Labor Force II	3 QH
ECN 3352	Economics of Manpower Planning I	3 QH
ECN 3353	Economics of Manpower Planning II	3 QH
ECN 3354	Economics of Medical Care & Health Manpower	3 QH
ECN 3355	Economics of Human Capital	3 QH
ECN 3356	Local Labor Market Research Methods & Problems	3 QH
ECN 3357	Human Resources Planning at State and Local Areas	3 QH
ECN 3358	Economics of Education & Training Programs	3 QH
ECN 3359	Seminar in Human Resource Development	3 QH
ECN 3360	Regional Economics	3 QH
ECN 3361	Externalities	3 QH
ECN 3362	Economics of Crime	3 QH
ECN 3363	Urban Economic Systems	3 QH
ECN 3364	Urban Economic Development	3 QH
ECN 3365	Economics of Urban Transportation	3 QH
ECN 3366	Economics of Intercity Transportation	3 QH

Course No.	Course Name	Credit
ECN 3369	Urban Regional Economics Seminar	3 QH
ECN 3370	Economic Development	3 QH
ECN 3371	Regional Development	3 QH
ECN 3372	Comparative Economic Development	3 QH
ECN 3373	Development Finance and Trade	3 QH
ECN 3379	Development Planning Seminar	3 QH
ECN 3380	Monetary Theory	3 QH
ECN 3381	Monetary Policy	3 QH
ECN 3384	Capital Markets	3 QH
ECN 3389	Money Credit Banking Seminar	3 QH
ECN 3390	Public Finance Theory I	3 QH
ECN 3391	Public Finance Theory II	3 QH
ECN 3392	Public Policy and Finance	3 QH
ECN 3399	Seminar in Public Finance	3 QH
ECN 3510	Microeconomic Theory II	4 QH
ECN 3511	Economics and the Law	1 QH
ECN 3520	Macroeconomic Theory II	4 QH
ECN 3530	Mathematics for Economics	4 QH
ECN 3540	Econometrics II	4 QH
ECN 3601	Doctoral Research Seminar I	4 QH
ECN 3602	Doctoral Research Seminar II	4 QH
ECN 3890	Master's Thesis Seminar	(Maximum 6 QH)
ECN 3895	Readings in Economics (Master's)	(Maximum 6 QH)
ECN 3896	Readings in Economics (PhD)	(Maximum 6 QH)
ECN 3899	Doctoral Dissertation Seminar	0 QH
ECN 3798	Master's Thesis Continuation	0 QH
ECN 3799	Doctoral Dissertation Continuation	0 QH

English

The graduate program in English engages many of the theoretical and applied issues generated by the study of literature and language—literary history and theory; linguistics, with particular application to stylistics and the teaching of writing; and creative and technical writing. Graduate study takes full advantage of the rich opportunities offered by Boston's museums and libraries.

The Department of English offers a range of programs. The Program in Literature, with the option of a Concentration in British Literature or a Concentration in American Literature, provides the opportunity for training in research and in theory as preparation for a career as a scholar and teacher of literature. The Program in Writing offers either a Concentration in Linguistics and Writing, which provides theoretical and practical preparation in the teaching of writing, or a Concentration in Technical and Professional Writing, which allows the student to prepare for a career as a professional writer.

Professors

Kinley E. Roby, PhD, *Pennsylvania State University, Chairperson*
Samuel J. Bernstein, PhD, *Brandeis University*
Robert J. Blanch, PhD, *State University of New York, Buffalo*
Francis C. Blessington, PhD, *Brown University*
Irene R. Fairley, PhD, *Harvard University*
Gary Goshgarian, PhD, *University of Wisconsin*
Earl N. Harbert, PhD, *University of Wisconsin*
Victor E. Howes, PhD, *Yale University*
M. X. Lesser, PhD, *Columbia University*
James Nagel, PhD, *Pennsylvania State University*
Jane A. Nelson, PhD, *University of Michigan*
Guy Rotella, PhD, *Boston College*
Herbert L. Sussman, PhD, *Harvard University*
Arthur J. Weitzman, PhD, *New York University*
Paul C. Wermuth, PhD, *Pennsylvania State University*
Joseph E. Westlund, PhD, *University of California, Berkeley*

Associate Professors

Timothy R. Donovan, PhD, *University of Wisconsin*

Gerald R. Griffin, PhD, *University of Massachusetts*

Stuart S. Peterfreund, PhD, *University of Washington*

Assistant Professors

Richard Bullock, PhD, *University of Virginia*

Michael B. Goodman, PhD, *State University of New York, Stony Brook*

Janet Randall, PhD, *University of Massachusetts*

Michael Ryan, PhD, *University of Iowa*

Kristin Woolever, PhD, *University of Pittsburgh*

Research

The faculty carries on an active program of research and writing reflecting the varied interests of the department—in literary studies and critical theory, in the writing of both poetry and fiction, and in the theory and practice of composition and of technical and professional writing. Graduate students work as editorial assistants for journals published by the department: *Romanticism Past and Present*, and *Studies in American Fiction*. The Northeastern University Center for Literary Studies, sponsored by the department, each year invites distinguished critics to discuss with students and faculty a single issue in literary theory; these debates are published as the annual *Proceedings of the Center for Literary Studies*.

Admission

For application procedures and requirements, please consult page 19. Applicants are judged favorably if they do superior work in their undergraduate preparation. Two recommendations should be submitted by professors familiar with the student's work in literature and writing. The Test of English as a Foreign Language (TOEFL) examination must be taken by international students. GRE's are recommended, but not required.

The category of special student is provided for those non-degree students who wish to take an individual course or those already enrolled in a graduate program in another institution who wish to transfer credit. An applicant already holding a graduate degree may also enroll as a special student.

The Master of Arts Degree in English

The Program in Literature requires that a student take courses in prescribed historical areas. The Program in Writing is organized differently, as set forth below. Both programs leading to

the MA in English require that the student fulfill the core curriculum.

The Core Curriculum All students earning the MA in English must take at least one course from each of the following categories:

Introduction to Literary Study (ENG 3300)

Theories of criticism or linguistics

British literature

American literature

All students earning the MA must take the MA comprehensive examination.

Program in Literature All students in this program must take a total of fourteen courses (forty-two quarter hours of credit). In addition to satisfying the requirements of the core curriculum, students in the Program in Literature must satisfy the following historical and national distribution requirements by taking at least one course in each of the following areas:

Medieval and early Renaissance literature (to 1660)

Restoration and eighteenth-century literature

Nineteenth-century literature

Twentieth-century literature

Each student must also satisfy distribution requirements by taking at least two of these fourteen courses in British literature and at least two of these fourteen courses in American literature. These distribution requirements represent the need to take one course in British literature and one course in American literature beyond those requirements mandated in the core curriculum. Courses in the core curriculum may be used to satisfy basic Program in Literature requirements.

The above are the minimum distribution requirements for the Program in Literature. In addition, all students sitting for the MA comprehensive examination must elect area I (Individual Work, to vary by year) and three other areas. At least one of the four areas chosen must be in British literature, and at least one of the areas chosen must be in American literature. Area I may be used to satisfy this examination breadth requirement.

Students have the option of exceeding the distribution requirements for the Program in Literature by electing to concentrate in either British or American literature.

Concentration in British Literature

A student pursuing a concentration in British literature must satisfy the requirements for the core curriculum and the Program in Literature, in addition to those for the concentration in

British literature. No course may be used to satisfy a requirement in both lists.

The concentration in British literature requires a minimum of five graduate courses, exclusive of those taken to fulfill the core curriculum and basic program requirements, selected so as to cover the following areas:

Medieval and early Renaissance literature (to 1660)—one course

Restoration and eighteenth-century British literature—one course

Nineteenth-century British literature—one course

Twentieth-century British literature—one course

British literature elective—one course

The student must elect three areas in British literature on the MA comprehensive examination. One of these areas must be the individual work.

Concentration in American Literature

A student pursuing a concentration in American literature must satisfy the requirements for the core curriculum and the Program in Literature, in addition to those for the concentration in American literature. No course may be used to satisfy a requirement in both lists.

The concentration in American literature requires a minimum of six graduate courses, exclusive of those taken to fulfill the core curriculum and basic program requirements, selected so as to cover the following areas:

Early American literature—one course

Nineteenth-century American literature—one course

Twentieth-century American literature—one course

American literature elective—three courses

The student must elect three areas in American literature on the MA comprehensive examination. One of these areas must be the individual work.

Program in Writing

Concentration in Linguistics and Writing

A student in the linguistics and writing concentration must satisfy the core curriculum requirements. All students in this concentration must take a total of fourteen courses (forty-two quarter hours of credit), of which seven courses (twenty-one quarter hours of credit) must be in linguistics and writing. At least one course must be taken in each of the following groups:

Group 1

ENG 3400 English Grammar

ENG 3404 Language & Its Structure

Group 2

- ENG 3321 Linguistics and Literary Study
- ENG 3401 Semantics
- ENG 3402 History of the English Language

Group 3

- ENG 3311 English Prose Style
- ENG 3322 Linguistics and the Art of Writing
- ENG 3353 Problems in Writing
- ENG 3403 Topics in Linguistics

Other courses in linguistics and writing listed in the catalog include the following:

- ENG 3312 Theories of Teaching of Writing
- ENG 3350 Creative Writing I (Prose)
- ENG 3351 Creative Writing II (Poetry)
- ENG 3354 Technical Writing
- ENG 3405 Descriptive Linguistics
- ENG 3406 Introduction to Syntax

The student must elect the areas of Linguistics, Writing and Applied Linguistics, and Individual Work (area I) on the MA comprehensive examination.

Concentration in Technical and Professional Writing

A student in the Technical and Professional Writing Concentration must satisfy the core curriculum requirements. All students in this concentration must take a total of fourteen courses (forty-two quarter hours of credit), of which six courses (eighteen quarter hours of credit) must be in the following areas. At least one course must be taken in each of the following groups:

Group 1

- ENG 3352 Writing for the Professions
- ENG 3354 Technical Writing

Group 2

- ENG 3349 Workshop in Writing for Publication
- ENG 3355 Topics in Technical Writing

Group 3

- ENG 3322 Linguistics and the Art of Writing
(or equivalent linguistics course)
- ENG 3348 Research Materials and Methods for Technical Writing

Group 4

- ENG 3358 Topics in Non-Fiction Prose
(or equivalent course in nonfiction prose)

Group 5

- ENG 3353 Problems in Writing
 - ENG 3602 Independent Study (in writing)
- Any writing course in groups 1 and 2 not taken for distribution in that area.

Group 6

Elective in science, technology, or the professions. One computer science course is recommended.

If the student's schedule allows, a course in graphic arts (including design, layout, and production) or in speech communications is recommended. Such coursework would need to be approved by the Graduate Director and the Director of the Graduate School in order to be accepted for graduate credit. The student must elect the areas of Writing and Applied Linguistics, Technical and Professional Writing, and Individual Work (area I) on the M.A. comprehensive examination.

Transfer Credit

A student may transfer from another institution no more than twelve quarter hours (nine semester hours) of graduate credit in English. Within this limit, graduate courses in other fields may also be transferred if their relevance to the student's program can be demonstrated. Please refer to the section on transfer credit on page 27 for full details.

Thesis

A thesis is optional. A student wishing to write a master's thesis must secure the approval of the chairperson of the graduate committee and must write the thesis under the supervision of a faculty adviser. Six quarter hours of credit in lieu of coursework is allowed. The student must enroll in ENG 3601, Thesis, to obtain credit.

Directed Study

A student may apply for a maximum of six quarter hours of directed study, not including a thesis.

Students must obtain the written consent of their academic adviser and then that of the instructor who will direct the study. A course proposal must be developed, outlining the works to be covered, the general requirements to be met, and the quarter hours of credit for which the study is offered. Such a proposal must be submitted for approval to the chairperson of the graduate committee.

Directed study is not permitted when a course in the same subject is offered during the academic year. Directed study should not substitute for regular course offerings.

Comprehensive Examination

A four-hour comprehensive examination, given during the spring quarter, is required. Copies of previous examinations are available in the departmental office. A student must accrue thirty quarter hours of credit with an average of 3.000 or higher before being eligible to take the examination. The examination may be taken only twice. Students may choose an oral examination in lieu of the written comprehensive. Students who wish to pursue this option must arrange to do so through the graduate committee chairperson.



Language Requirement

A degree candidate must demonstrate proficiency in a language other than English. This may be done by passing a reading examination or by advanced course work. Students must, by the end of the spring quarter of their first year, declare the language in which they will satisfy this requirement and the way in which they intend to demonstrate proficiency.

Grades

To qualify for the comprehensive examination and for the degree, a student must achieve a minimum cumulative average of 3.000. Students who receive more than two C's in their first two quarters of residence may be dropped from the program. An incomplete grade is granted only in extraordinary circumstances and is not given automatically. Please refer to the section on grades on page 24.

Residence and Time Limitation

A student who does not register for a course in a calendar year must reapply for admittance to the program. Course credits are valid for a maximum of seven years, unless an extension is allowed by the director of the Graduate School of Arts and Sciences.

Awards

Teaching assistantships are awarded on a competitive basis to a limited number of entering and continuing students. These assistantships provide both a waiver of tuition and a stipend. A teaching assistant takes a minimum of two courses each quarter, but he/she may take more with permission. Teaching assistants are expected to make satisfactory progress toward the degree.

Northeastern University Tuition Assistantships, which provide a waiver of tuition to students who assist faculty in research for ten hours a week, are also available to a limited number of entering and continuing students. For further details regarding assistantships, see pages 161–162.

Master of Technical and Professional Writing

The Master of Technical and Professional Writing provides the opportunity for graduate training for those who wish to become professional writers in industry, science, business, government, and related fields. Courses have been selected to give students the opportunity to acquire the following: first, the writing, research, and editing skills they will need; second, background in an appropriate area of science, technology, or business; and third, other communication skills in graphic arts and speech communication.

Students must take a total of fourteen courses (forty-two quarter hours).

In place of the M.A. Comprehensive Examination, students will be required to complete a portfolio of technical or professional writing and defend it before a committee of graduate faculty from the English Department and faculty from the student's scientific, technical, or professional area of study. Whenever possible, we will place students in internships in industry or on campus. Writing done in these internships can serve as all or part of the portfolio.

Students in the program will be eligible for teaching assistantships, awarded on a competitive basis. These provide a waiver of tuition. A stipend is also given with the award in return for academic assistance in the department in areas directly related to the teaching function.

Course Requirements

The following fourteen required courses and electives comprise the Master of Technical and Professional Writing. Of these, seven courses must be in writing, editing, research materials or theory, linguistics, non-fiction prose, and a final writing project. These seven courses will be offered by the English Department. Additional course work will be taken in such areas as computer science, other sciences, graphic arts, and speech communication.

Courses in the English Department

Writing Courses

Three of the following:

- ENG 3354 Technical Writing
- ENG 3355 Topics in Technical Writing
- ENG 3352 Writing for the Professions (Business Administration)
- ENG 3349 Workshop in Writing for Publication in Technical, Scientific, and Professional Journals

Required Courses

- ENG 3322 Linguistics and the Art of Writing (or equivalent linguistics course)
- ENG 3348 Research Materials and Methods of Technical, Scientific, and Professional Writing
- ENG 3604 Independent Project in Technical and Professional Writing

Electives

One of the following, or equivalent, by consent of adviser, or a course not taken in the Writing Courses section, above.

- ENG 3358 Topics in Non-Fiction Prose
- ENG 3353 Problems in Writing
- ENG 3602 Independent Study

Courses in Computer Science

- CMTH 1172 PASCAL
- or
- BCOM 1100 PASCAL I

One of these courses or, by consent of an adviser, an equivalent programming language. Courses in BASIC or Introduction to Data Processing will not count as credits toward the degree.

Professional Sequence

Three graduate-level courses in *one* technical, scientific, professional, or literary area, for example, computer science, natural sciences (biology, chemistry, mathematics, physics), pharmacy or health sciences, engineering, or business administration. Other areas may be substituted by consent of an adviser from the graduate faculty. Courses must be graduate-level or upper-division undergraduate courses including graduate level work.

Elective

One elective from one of the groups listed in Professional Sequence section or other area.

Technical Writing Training Program

The Department of English, in cooperation with the Graduate School of Arts and Sciences, offers a training program in computer science and technical writing for the computer industry, open to those holding at least a bachelor's degree in any discipline.

This full-time program leads to a certificate of completion. Although no degree is awarded, the English courses carry full graduate credit. Emphasis is placed on professional placement.

Admission

Candidates must submit undergraduate and graduate transcripts, three letters of recommendation from professors or supervisors familiar with their work, and professional or academic writing samples. Candidates are also required to score above average on the SRA Computer Programmer Aptitude Battery, and to have taken at least one programming course.

Program

This certificate program is designed to be completed in one academic year. Three intensive courses in computer science and three intensive courses in technical writing are required; they will be determined in advance by the program directors.

Certificate of Advanced Graduate Study

The Department of English offers a program of post-master's work in literary study designed for those people who already

hold the master's degree. The program is designed for both full-time and part-time study. Teaching Assistantships and Northeastern University Tuition Assistantships are available to a limited number of entering and continuing students in the program.

Admission

Applicants must have a master's degree in literature or writing and are expected to submit transcripts of undergraduate and graduate work.

Program

Each student will follow a specialized course of study built around his/her own needs and designed in close association with a faculty adviser. The student must develop the outline of this program by the end of the first quarter of work at Northeastern and follow the program, under the supervision of the adviser, throughout his/her work at Northeastern. Forty-two quarter hours of work are needed to complete the program. It is expected that at least one of these courses will be ENG 3603 Independent Study, CAGS. With permission of the adviser, the student may take up to three graduate courses in other departments.

Examination

The student must pass an oral comprehensive examination and be evaluated on a lecture/classroom presentation, each to be based on the student's specialized program of study.

Martha's Vineyard Summer Workshops

The Department of English, in cooperation with the Office of Special Programs of the College of Arts and Sciences, offers a series of workshops on writing and its teaching. Held during June and July on the island of Martha's Vineyard, these workshops are open to language arts and English teachers at all levels, from kindergarten through college.

The workshops, which are usually two weeks long, offer both introductory and advanced work, including two workshops on teaching writing at the elementary and secondary levels and two Institutes on Writing composed of several workshops on more specialized topics. Students may also participate in a year-long classroom research project. In addition to English Department faculty, leading specialists in writing and its teaching are invited to lead the workshops, which carry full graduate credit.

For information on specific workshops and application materials, write the Office of Special Programs, College of Arts and

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

All courses carry three quarter hours of credit unless otherwise specified.

Course No.	Course Name
ENG 3300	An Introduction to Literary Study
ENG 3311	English Prose Style
ENG 3312	Theories of Teaching Writing
ENG 3315	Theories of Criticism
ENG 3316	Critical Schools
ENG 3317	Topics in Criticism
ENG 3321	Linguistics and Literary Study
ENG 3322	Linguistics and the Art of Writing
ENG 3323	Theatrical Styles
ENG 3324	Perspectives on American Literature
ENG 3325	Topics in Early American Literature
ENG 3326	Topics in 20th-Century American Literature
ENG 3327	Major American Novelist
ENG 3328	Major American Playwright
ENG 3329	Major American Poet
ENG 3330	American Drama
ENG 3331	Topics in American Literature
ENG 3348	Research Materials and Methods for Technical Writing
ENG 3349	Workshop in Writing for Publication
ENG 3350	Creative Writing I (Prose)
ENG 3351	Creative Writing II (Poetry)
ENG 3352	Writing for the Professions
ENG 3353	Problems in Writing
ENG 3354	Technical Writing
ENG 3355	Topics in Technical Writing
ENG 3356	Topics in Writing
ENG 3357	Topics in Writing
ENG 3358	Topics in Non-Fiction Prose
ENG 3400	English Grammar
ENG 3401	Semantics
ENG 3402	History of the English Language
ENG 3403	Topics in Linguistics
ENG 3404	Language & Its Structure
ENG 3405	Descriptive Linguistics
ENG 3406	Introduction to Syntax
ENG 3407	Children's Literature
ENG 3408	Literature and the Visual Arts
ENG 3409	Literature and Psychology
ENG 3410	Short Story
ENG 3411	Comic Drama
ENG 3412	Tragic Drama
ENG 3414	Satire
ENG 3415	Literary Impressionism

Course No.	Course Name
ENG 3416	20th-Century British Drama
ENG 3417	Topics in 20th-Century European Literature
ENG 3418	Topics in 20th-Century Literature
ENG 3419	Topics in Genre
ENG 3550	Classical Backgrounds
ENG 3551	Chaucer's <i>Troilus and Criseyde</i>
ENG 3552	Chaucer's <i>Canterbury Tales</i>
ENG 3553	Middle English Lyrics and Drama
ENG 3554	Studies in 14th-Century Literature
ENG 3555	Tudor Poetry
ENG 3556	Renaissance Drama
ENG 3558	Shakespeare's Tragedies
ENG 3559	Shakespeare's Comedies
ENG 3560	Problems in Shakespearean Interpretation
ENG 3561	17th-Century Literature
ENG 3562	Milton's Major Poetry
ENG 3563	Restoration and Early 18th-Century Literature
ENG 3564	Age of Johnson
ENG 3565	Topics in Augustan Literature
ENG 3566	18th-Century Fiction
ENG 3567	Individual 18th-Century Novelist
ENG 3568	Romantic Poetry
ENG 3569	Romantic Literature
ENG 3570	Topics in Romanticism
ENG 3571	Victorian Literature
ENG 3572	Victorian Poetry
ENG 3573	Victorian Novel
ENG 3575	Topics in Victorian Literature
ENG 3577	20th-Century British Poetry
ENG 3580	20th-Century British Fiction
ENG 3582	Topics in Irish Literature
ENG 3583	Topics in Early American Literature
ENG 3585	19th-Century American Literature
ENG 3586	19th-Century American Prose, 1820-1865
ENG 3587	19th-Century American Poetry
ENG 3589	19th-Century American Prose, 1865-1900
ENG 3591	Modern American Poetry
ENG 3592	Modern American Drama
ENG 3593	Individual Modern American Poet
ENG 3594	Contemporary American Prose
ENG 3595	Individual Modern American Novelist
ENG 3596	Individual American Writer
ENG 3597	Contemporary American Poetry
ENG 3598	Modern American Prose
ENG 3599	Humor in American Literature
ENG 3600	Topics in 19th-Century European Literature
ENG 3601	Thesis
ENG 3602	Independent Study
ENG 3603	Independent Study, CAGS
ENG 3604	Independent Project, Technical and Professional Writing
ENG 3798	Master's Thesis Continuation

History

The study of history encompasses the entire range of human experience at all times and in all places. At the graduate level at Northeastern University, students in history study methodology and historiography, pursue original research and writing in seminars, and specialize in periods, areas, or fields of particular interest to them.

Professors

Raymond H. Robinson, PhD, *Harvard University, Chairperson*
Philip N. Backstrom, Jr., PhD, *Boston University*
William M. Fowler, PhD, *University of Notre Dame*
Donald M. Jacobs, PhD, *Boston University*
John D. Post, PhD, *Boston University*

Associate Professors

Charmarie J. Blaisdell, PhD, *Tufts University*
Ballard C. Campbell, PhD, *University of Wisconsin*
Norbert L. Fullington, PhD, *Harvard University*
LaVerne J. Kuhnke, PhD, *University of Chicago*
Clay McShane, PhD, *University of Wisconsin*
Stanley R. Stembridge, PhD, *Harvard University*

Assistant Professors

Laura L. Frader, PhD, *University of Rochester*
Ruth-Ann M. Harris, PhD, *Tufts University*
Gerald H. Herman, MA, *Northeastern University*
Patrick R. Manning, PhD, *University of Wisconsin*
Martin R. Ring, PhD, *Tulane University*

Lecturers

Ralph J. Crandall, *New England Historic Genealogical Society*
David C. Dearborn, *New England Historic Genealogical Society*
David S. Gillespie, *National Trust for Historic Preservation*
Henry J. Gwiazda II, *John F. Kennedy Library*
Pauline Chase Harrell, *Boston Landmarks Commission*
Thomas W. Leavitt, *Museum of American Textile History*
Robert V. Sparks, *Massachusetts Historical Society*

Research

Faculty research interests cover a wide spectrum. Recently published books include *Parliament, the Press, and the Colonies; Representative Democracy: Public Policy and Midwestern Legislatures in the Late Nineteenth Century; Index to the American Slave; and Jack Tars and Commodores: A History of the American Navy, 1783–1815*. Awaiting publication is a book on food shortage, climatic variability, and epidemic disease in early Europe. Research projects under way include studies of women in the Reformation, agricultural labor and collective action in southern France, and the legacy of Islamic medicine. A computer-aided analysis of “Missing Friends” advertisements in the *Boston Pilot* as genealogical source and social history data of county origins of Irish immigrants and a project for public radio on the culture of the late nineteenth century are also in progress.

The Master's Degree

Admission

Procedures and requirements are discussed on page 19. Applicants for the fall quarter who submit their application and all supporting documents by March 15 will be notified on or about April 1. Students who are interested in financial assistance must file all material by March 15.

Programs

Two programs are available for candidates for the Master of Arts degree.

Option I

This program is designed for those who are interested in pursuing careers in research, writing, and teaching and requires forty-one quarter hours of academic work.

Students must take the following courses:

- | | |
|----------|-------------------------|
| HST 3241 | Methodology |
| HST 3242 | European Historiography |
| | or |
| HST 3243 | American Historians |

Two courses specifically labeled “seminar,” except for students writing theses, who need take only one seminar.

Students must complete HST 3241 prior to enrolling in seminars, and grades of at least B must be obtained in the seminars.

In addition, students must complete at least one course in each of three areas: group 1, Europe; group 2, United States; and group 3, other areas. Group requirements are not satisfied by the historiography courses, HST 3242 and HST 3243.

With the prior approval of the faculty adviser, a maximum of three courses may be elected from either graduate courses in other departments or advanced undergraduate courses in history or related subjects. The undergraduate courses also require the approval of the Director of the Graduate School of Arts and Sciences.

A thesis is optional with the approval of the graduate committee. If approved, a thesis carries nine quarter hours of credit.

Option II

The second option, focusing on historical agencies and administration, is designed for those interested in careers outside the classroom. The subject matter of this option comprises the new and developing area of public, or applied, history. Many of the courses are taught by professionals in the Boston area.

The program requires forty-two quarter hours of academic work. The following courses are required:

HST 3241	Methodology
HST 3242	European Historiography
	or
HST 3243	American Historians
INT 3540	Computer Applications for Non-Profit Organizations
HST 3821	Fieldwork in History I
HST 3822	Fieldwork in History II
One course specifically labeled "seminar."	

In addition, students must select four of the following:

HST 3601	Historical Administration
HST 3602	Historical Societies and Archives
HST 3603	Historical Exhibits and Museums
HST 3605	Historical Editing
HST 3610	Industrial Archeology
HST 3611	Historic Preservation
HST 3620	Oral History
HST 3621	Genealogical Research: Methods and Uses
HST 3622	Local History Methodology
HST 3625	Media and History

The remaining three courses are taken from the list of graduate courses in history.

With the prior approval of the faculty adviser, a maximum of three courses may be elected from either graduate courses in other departments or advanced undergraduate courses in history or related subjects. The undergraduate courses also require the approval of the Director of the Graduate School of Arts and Sciences.

A brochure describing this second option in further detail is available by request from the Department of History.

Comprehensive Examination

All degree candidates must pass a written comprehensive examination or satisfy an optional requirement specified by the department.

Language Requirement

Degree candidates must demonstrate proficiency in a foreign language approved by the department or, as an alternative option, proficiency in either computer programming or advanced statistics.

Financial Aid

Each year a limited number of teaching assistantships are awarded on a competitive basis to both entering and continuing students. In addition, several Northeastern University Tuition Assistantships are available. Please see page 161 for further details.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
HST 3241	Methodology	3 QH
HST 3242	European Historiography	3 QH
HST 3243	American Historians	3 QH
HST 3301	Ancient Greece	3 QH
HST 3302	Ancient Rome	3 QH
HST 3306	The Renaissance	3 QH
HST 3307	The Reformation	3 QH
HST 3310	Intellectual History of Europe 1688–1789	3 QH
HST 3311	Intellectual History of Europe 1789–1870	3 QH
HST 3312	Intellectual History of Europe 1870–1950	3 QH
HST 3315	Diplomatic History of Europe 1815–1914	3 QH
HST 3318	Imperialism	3 QH

Course No.	Course Name	Credit
HST 3320	20th Century Europe	3 QH
HST 3322	Socialism and Revolution	3 QH
HST 3330	Britain 1688–1815	3 QH
HST 3331	Britain 1815–1914	3 QH
HST 3332	Britain Since 1914	3 QH
HST 3339	Modernization of Ireland	3 QH
HST 3345	Hitler's Germany	3 QH
HST 3370	Family History	3 QH
HST 3380	Seminar in the Renaissance	4 QH
HST 3381	Seminar in the Reformation	4 QH
HST 3382	Seminar in European Intellectual History	4 QH
HST 3383	Seminar in 19th Century Europe	4 QH
HST 3384	Seminar in 20th Century Europe	4 QH
HST 3385	Seminar in European Social History	4 QH
HST 3386	Seminar in Imperialism	4 QH
HST 3387	Seminar in 19th Century Britain	4 QH
HST 3388	Seminar in 20th Century Britain	4 QH
HST 3389	Seminar in Modern France	4 QH
HST 3390	Seminar in Russian History	4 QH
HST 3397	Seminar in Comparative Labor History	4 QH
HST 3399	Seminar in Approaches to Women's History	4 QH
HST 3404	Colonial America: The 17th Century	3 QH
HST 3405	Colonial America: The 18th Century	3 QH
HST 3407	The American Revolution	3 QH
HST 3410	Topics in American Reform	3 QH
HST 3413	Topics in the Civil War and Reconstruction	3 QH
HST 3420	Public Life in 19th Century America	3 QH
HST 3421	Political Change in 20th Century America	3 QH
HST 3423	The Age of Roosevelt	3 QH
HST 3434	American Social History 1900–1950	3 QH
HST 3440	African-American History I	3 QH
HST 3441	African-American History II	3 QH
HST 3442	New Perspectives on American Slavery	3 QH
HST 3450	Boston As a City	3 QH
HST 3480	Seminar in American History	4 QH
HST 3481	Seminar in Colonial and Revolutionary America	4 QH
HST 3482	Seminar in American Governmental History	4 QH
HST 3483	Seminar in American Urban History	4 QH
HST 3484	Seminar in American Maritime History	4 QH
HST 3485	Seminar in African-American History	4 QH
HST 3486	Seminar in Recent American History	4 QH
HST 3501	History of Exploration	3 QH
HST 3503	Approaches to World History	3 QH
HST 3505	Canada and the United States	3 QH
HST 3508	Modern Africa	3 QH
HST 3509	Pan-Africanism	3 QH
HST 3510	History of the Islamic Peoples	3 QH
HST 3512	Modern Middle East	3 QH
HST 3523	Modern Japan	3 QH
HST 3529	Communism in China	3 QH
HST 3531	Population in History	3 QH
HST 3533	Psycho-History	3 QH
HST 3540	Economic History of the Modern Western World	3 QH
HST 3601	Historical Administration	3 QH
HST 3602	Historical Societies and Archives	3 QH
HST 3603	Historical Exhibits and Museums	3 QH
HST 3605	Historical Editing	3 QH
HST 3610	Industrial Archeology	3 QH
HST 3611	Historic Preservation	3 QH

Course No.	Course Name	Credit
HST 3620	Oral History	3 QH
HST 3621	Genealogical Research: Methods and Uses	3 QH
HST 3622	Local History Methodology	3 QH
HST 3625	Media and History	3 QH
HST 3805	Assigned Reading	1 QH
HST 3806	Assigned Reading	2 QH
HST 3807	Assigned Reading	3 QH
HST 3811	Thesis	9 QH
HST 3812	Thesis	3 QH
HST 3813	Thesis	3 QH
HST 3821	Fieldwork in History I	4 QH
HST 3822	Fieldwork in History II	4 QH

Journalism

Professors

LaRue W. Gilleland, M.A.J., Chairman

Associate Professors

William Kirtz, M.S.

Patricia Hastings, PhD.

Assistant Professors

William James Willis, PhD, Graduate Coordinator

Jane Bick, M.A.

Charles Fountain, M.A.

Carolyn Toll Oppenheim, M.A.

Louis E. Conrad, M.A.

Admission

In addition to the general regulations listed earlier in the graduate catalog, an applicant must display a genuine interest in print or broadcast journalism. No prior course work in journalism is required, but a student should have earned a B average in undergraduate work. Exceptions may be made for students displaying unusual talent in the areas of writing and reporting. In addition, the Graduate Record Exam must be taken, and the results must be submitted to the Arts and Sciences Graduate Office.

Cooperative Education

The Journalism Department offers a unique dimension to the traditional master's degree program. This approach is a balance of academic study at the University and practical on-the-job assignments in the various media and related agencies. Graduate students in all degree tracks may elect to alternate classroom study with three or six months of paid media work.

Program Planning

Prospective students and current students should discuss their programs with the graduate coordinator, who may be reached by calling 437-3236.

Transfer of Credits

A student may transfer up to two graduate courses (and no more than twelve quarter hours) from other accredited universities, with the approval of the graduate coordinator for jour-

nalism. (see page 27 for the Graduate School policy on transfer credit.)

Degree Requirements

Master of Arts in Journalism

The Master of Arts degree offers a professional and a research track. Each requires successful completion of 12 courses and a comprehensive examination. A core curriculum of four courses is required in both tracks. The core includes:

JRN 3679	Research Methods in Journalism
JRN 3682	Mass Communication Theories
JRN 3684	Literature of Journalism
JRN 3870	Graduate Seminar

From this point, the course requirements for professional and research track differ as follows:

A. *Professional track.* This track is for the student who has earned a bachelor's degree in a non-journalistic field and who has little or no news media experience. This track includes intensive work to develop competency in reporting, writing, editing, and associated skills.

Required undergraduate journalism courses (which carry no graduate credit) for the professional track are:

JRN 1103	Newswriting I
JRN 1104	Newswriting II
JRN 1206	Editing

Required graduate courses (in addition to the core) are:

JRN 3501	History of Journalism
JRN 3512	Journalism Ethics and Issues
JRN 3508	Law of the Press
JRN 3898	Specialized Reporting Practicum (8 credits)

In addition, each student must take three graduate journalism electives.

B. *Research track.* This track, which requires a thesis for the student with a bachelor's degree in journalism or extensive news media experience who plans a career in research or specialized writing.

With approval of a graduate adviser, the student selects an area of interest (possibilities among others include libel law, journalism ethics, broadcast regulation, local government reporting, or covering the criminal justice system) which will become the focus of the thesis and selection of courses, both journalism and non-journalism. At least one member of the student's thesis committee will represent a department outside of journalism most closely associated with student's research.

Required graduate courses, in addition to the core, fall into three categories:

I. JRN 3897 Thesis (8 credits)

II. Graduate Journalism electives. A maximum of three may be taken from this list:

JRN 3432	Local Government Reporting
JRN 3617	The Constitution and Mass Communications
JRN 3575	News Media Management
JRN 3870	Graduate Seminar (may be repeated here when topic changes)
JRN 3890	Directed Study

III. Graduate courses outside of journalism which relate to the student's research. Up to four such courses may be taken.

The total number of courses required in the research track is 12.

Master of Journalism in News Media Management

This degree is for the student with a bachelor's degree in journalism and/or at least two years experience as a reporter or editor or advertising representative, who wants to prepare for an eventual position such as publisher, managing editor, or advertising director. The Master of Journalism in News Media Management benefits from participation by the Graduate School of Business Administration from which three of the courses in this 12-course degree program are taken.

To obtain this degree, the student must complete six journalism courses, a concentration of three business courses, and three electives from such fields as economics, sociology or psychology. Three business concentrations are available, and the student will select one depending on his/her career objective. They are (1) General Business, for the student interested in publishing or broadcast news media management, (2) Marketing and Sales, for the student interested in advertising, research or circulation management, and (3) Organizational Behavior, for the student interested in news department management.

The student must also pass a comprehensive examination.

All students in the Master of Journalism program must have taken an undergraduate accounting principles course before beginning work on any graduate business courses. An undergraduate accounting course does not carry graduate credit.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

(All courses carry four hours credit unless otherwise specified)

JRN 3432	Local Government Reporting
JRN 3501	History of Journalism
JRN 3508	Law of the Press
JRN 3512	Journalism Ethics and Issue
JRN 3575	News Media Management
JRN 3617	The Constitution and Mass Communications
JRN 3677	The News Media Mix and Its Environment
JRN 3678	Applied Leadership Techniques
JRN 3679	Research Methods in Journalism
JRN 3682	Mass Communication Theories
JRN 3684	Literature of Journalism
JRN 3691	Professional Paper
JRN 3870	Graduate Seminar
JRN 3890	Directed Study
3891	
JRN 3897	Thesis (8 credits)
JRN 3898	Specialized Reporting Practicum (8 credits)

Law, Policy, and Society

In the 1982 fall quarter, the Graduate School of Arts and Sciences at Northeastern University began offering an interdisciplinary program in law, policy, and society leading to the doctor of philosophy degree. Designed chiefly to help provide an interdisciplinary perspective on legal and social issues to those interested in social policy careers, the program is open to applicants who possess a master's degree in a social science or related field or have earned a law degree.

An optional program leading to the master of science degree in law, policy, and society is also available to students who have already earned a JD or who are enrolled in the Northeastern University School of Law and wish to pursue a combined MS/JD program of study.

The law, policy, and society programs are in response to the increasing demand for qualified people who have the interdisciplinary training necessary to deal effectively with those areas in which the concerns of social scientists merge with the interests of legal professionals.

Affiliated Faculty

African-American Studies

Holly Carter, PhD, *Massachusetts Institute of Technology*

Business Administration

Angelo J. Fiumara, JD, *Boston College*

Christine Hobart, DBA, *Harvard University*

Carl W. Nelson, PhD, *University of Manchester, England*

Criminal Justice

Romine Deming, PhD, *Iowa State University*

Theodore Ferdinand, PhD, *University of Michigan*

Edith Flynn, PhD, *University of Illinois*

James Fox, PhD, *University of Pennsylvania*

John Laub, PhD, *State University of New York, Albany*

Nicole Hahn Rafter, PhD, *State University of New York, Albany*

Economics

Neil Alper, PhD, *University of Pittsburgh*
Kamran Dadkhah, PhD, *Indiana University*
Barbara Fraumeni, PhD, *Boston College*
Harold M. Goldstein, PhD, *Clark University*
Daryl A. Hellman, PhD, *Rutgers University*
Morris A. Horowitz, PhD, *Harvard University*
Gregory Wassall, PhD, *Rutgers University*

History

Ballard Campbell, PhD, *University of Wisconsin*
Donald M. Jacobs, PhD, *Boston University*
Clay McShane, PhD, *University of Wisconsin*

Human Development Professions

Susan Ellerin, PhD, *University of Pennsylvania*
Irene Nichols, EdD, *Harvard University*
Paul Tedesco, PhD, *Boston University*

Law School

Richard Daynard, LLB, *Harvard University*, PhD, *Massachusetts Institute of Technology*
Daniel Givelber, LLB, *Harvard University*
Michael Melstner, LLB, *Yale Law School*
Manuel Rodriguez-Orellana, JD, *Boston College Law School*, LL.M., *Harvard University*
Stephen Subrin, LLB, *Harvard University*

Philosophy

Bart Gruzalski, PhD, *University of Maryland*
Stephen Nathanson, PhD, *Johns Hopkins University*

Political Science

Robert L. Cord, PhD, *Syracuse University*
Robert E. Gilbert, PhD, *University of Massachusetts*
Bruce M. Logan, PhD, *University of Chicago*
Eileen M. McDonagh, PhD, *Harvard University*

Sociology and Anthropology

Richard Bourne, PhD, *Harvard University*, JD, *Boston University*
M. Patricia Golden, PhD, *Cornell University*
Maureen Kelleher, PhD, *University of Missouri*, *Columbia*
Thomas H. Koenig, PhD, *University of California*, *Santa Barbara*
Elliot A. Krause, PhD, *Boston University*
Bruce MacMurray, PhD, *University of Iowa*
Judith Perrolle, PhD, *Brown University*
Earl Rubington, PhD, *Yale University*

Michael Rustad, PhD, *Boston College*

Carmen J. Sirianni, PhD, *State University of New York, Binghamton*

Research

A number of research centers affiliated with the program provide students with opportunities to become familiar with current research issues and methodologies and, on occasion, hire students as research assistants.

The Center for Applied Social Research

Established in 1979, the center conducts interdisciplinary research in the social sciences on issues in criminal justice, public safety, mental health, social welfare, and education. Much of this work studies the relationship between the law and its impact on society and social behavior. William Bowers, PhD, is the director of the center.

The Center for Urban and Regional Economic Studies

This center recently has conducted research on the economic impact of a military installation on the neighboring region, has evaluated property tax relief in Connecticut, has examined the interrelationship between urban property values and urban crime control, and has investigated the nature and extent of violence in the Boston public schools. Daryl Hellman, PhD, is the director of the center.

The Center for Medical Manpower Studies

Since 1967, the center has conducted research on a wide variety of medical issues, including the costs of medical care, analysis of health-care plans, employment in the medical profession from nurses' aides to physicians, and the licensing and legal status of health-care professionals. Harold Goldstein, PhD, is the director of the center.

The Center for Labor Market Studies

The center conducts research and advises government agencies and nonprofit organizations on employment, training, and welfare. The staff has also provided technical assistance and training for government agencies and for employment and labor market programs. Andrew Sum is the director of the program.

Program Administration

The programs in law, policy, and society are administered by a graduate coordinator appointed by the dean of the College of Arts and Sciences. The graduate coordinator chairs the program coordinating committee, which consists of elected members from the College of Criminal Justice, School of Law, Boston-Bouvé College of Human Development Professions, and various departments within the College of Arts and Sciences.

Advising, course development, thesis supervision, and other academic responsibilities are shared by faculty members affiliated with the program.

Admission

Students seeking admission to the PhD program in law, policy, and society must have completed a master's degree in a related discipline, such as economics, sociology, education, criminal justice, or legal history or have a recognized law degree. The MS program is offered to qualified individuals who hold a recognized law degree, while the combined MS/JD program is restricted to students accepted by Northeastern University's School of Law.

Applications to the program are considered for the fall quarter of each year. Application materials for the graduate programs in law, policy, and society may be obtained from the graduate coordinator of the program. To be considered for admission, applicants must submit an official copy of transcripts, indicating the award of prerequisite degrees as outlined above. In addition, a completed application, three letters of recommendation testifying to the student's ability to complete a graduate program, a statement explaining the applicant's interest in studying in the program, and official scores from the Graduate Record Examination (General Test only) or the Law School Admission Test are required. International students seeking admission to these programs should consult earlier sections of this catalog for information about additional requirements applying to them.

All application materials must be received no later than March 15 of the spring preceding the fall quarter for which admission is requested. Materials should be mailed to:

Law, Policy, and Society Graduate Coordinator
301 Lake Hall
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115

Official scores from the Graduate Record Examination (General Test) or the Law School Admission Test should be forwarded to the office of the Graduate School of Arts and Sciences.

PhD Program in Law, Policy, and Society

Program

The program of study can be pursued full- or part-time, provided that all coursework is completed within three academic years. At least thirty-three quarter hours of graduate work be-

yond the master's or law degree is required for the PhD. This work must include sixteen quarter hours of work in core requirements and a concentration of seventeen quarter hours.

Core Course Requirements

The following courses constitute the core requirement:

INT 3249–INT 3250		
	Law, Policy, and Society Survey	4 QH
LAW 2364	Legal Research and Bibliography	1 QH
ECN 3512	Introduction to Microeconomic Theory	3 QH
ECN 3511	Economics and the Law	1 QH
SOC 3113	Introduction to Research Methods	2 QH
SOC 3114	Introduction to Quantitative Research Methods	2 QH
	An elective in the Law School	3 QH

Students may petition the program curriculum committee to waive the requirements for Legal Research and Bibliography (LAW 2364) and Introduction to Microeconomic Theory (ECN 3512) by providing appropriate evidence of equivalent competence.

In fulfilling the core course requirements, students are expected to demonstrate competence in statistical inference on a proficiency examination as a prerequisite to enrolling in Introduction to Research Methods (SOC 3113). Students who fail the proficiency examination must take an appropriate course (e.g., ECN 3240, SOC 3115, ED 3341) to make up the deficiency; however, credits earned in such a course may not be counted toward the minimum thirty-three quarter hours required for the degree.

Concentration Requirements

The remainder of the doctoral program curriculum in law, policy, and society is organized within an area of concentration proposed by the student and developed with a faculty adviser. A proposed concentration must be approved by the program coordinating committee and must include several disciplines in the study of one topical area of law, policy, and society. To fulfill concentration requirements, students must complete at least seventeen quarter hours of coursework selected from related areas in at least three affiliated academic units (departments or colleges). Each concentration may comprise general electives, chosen from those listed below, as well as courses more narrowly related to the specific area of interest. General electives are courses that have been identified as potentially relevant to any concentration area.

Several specimen concentrations are provided for illustration, below; others may be proposed. Students choosing to follow one of the sample concentrations have the opportunity to make additional specific course suggestions, with their advisers, that are appropriate to their backgrounds and goals.

**Comprehensive
Qualifying
Examinations**

After completing the course requirements, each student must pass comprehensive qualifying examinations, consisting of two parts: (1) a written examination in the broad area of law, policy, and society, including relevant theoretical and methodological issues; and (2) an individual written examination or a state-of-the-art paper in the student's selected concentration area.

Degree Candidacy

Degree candidacy is established when the student has completed the minimum number of quarter hours required for the degree and has passed the comprehensive qualifying examinations.

**Language
Requirement**

Students are expected to demonstrate competence in one language, other than English, that is relevant to the study of law, policy, and society. Students must submit their choice of language to the program curriculum committee for approval. A demonstration of computer literacy may be substituted to fulfill this requirement.

Dissertation

An original doctoral dissertation is required of all doctoral students, in accordance with the general regulations of the Graduate School of Arts and Sciences. The student's thesis adviser and at least one other member of the thesis committee must have affiliate status in the Law, Policy, and Society Program.

**Final Oral
Examination**

In keeping with the academic requirements of the Graduate School of Arts and Sciences, doctoral candidates must also pass a final oral examination on the subject explored in their doctoral dissertation, including important developments in the field covered in the dissertation.

This examination is taken after the student has completed all other degree requirements and must be held at least two weeks prior to the commencement at which the degree is to be awarded.

MS Program in Law, Policy, and Society

Students accepted into the ms program or the combined ms/jd program must complete a minimum of forty quarter hours of graduate work, including the sixteen quarter hours of core course requirements and seventeen quarter hours of concentration requirements outlined for the doctoral program. Students in the combined ms/jd program may transfer no more than seven quarter hours of law school coursework for credit toward the degree.

In addition to course requirements, students must pass the first part of the qualifying examinations described above to fulfill the requirements for the master of science degree in law, policy, and society.

General Elective Courses

The following general elective courses are recommended as being potentially relevant to any concentration area. Unless otherwise indicated, all courses carry three quarter hours of graduate credit. Students should consult the course listings of the North-eastern graduate schools to obtain complete course descriptions.

SOC 3120	Seminar in Qualitative Analysis I
SOC 3121	Seminar in Qualitative Analysis II
SOC 3186	Social Control I
SOC 3187	Social Control II
SOC 3206	Sociology of Law
SOC 3320	Multiple Regression in Sociological Analysis
SOC 3325	Sociology of Policy, Planning, and Evaluation
SOA 3355	Anthropology of Law and Conflict
SOC 3240	Formal Organizations
POL 3512	American Constitutional Law 1
POL 3514	American Constitutional Law 2
ECN 3150	Microeconomic Policy Planning Seminar
ECN 3241	Econometrics I
ECN 3383	Intergovernmental Fiscal Relations
ECN 3540	Econometrics II
CJ 3520	Conflict Management

Suggested Model Concentrations

The following model concentrations, including suggested coursework, are provided to illustrate the kinds of programs students may wish to design. The specific selection of coursework in any area, however, may be determined by the student and an academic adviser. Typically, a concentration consists of six courses.

The appropriate graduate school bulletin should be consulted for complete descriptions of courses suggested for model concentrations. Some courses offered by the Graduate School of Business Administration are among those suggested for specific

areas. Students wishing to enroll in these courses should seek the permission of the Director of the Graduate School of Business Administration.

Environmental Protection

The social and legal implications of environmental management make up one of the more complex issues confronting our society. A concentration in this area would focus on the impacts of technology on the environment—noise, chemical pollution, and conservation—and the influences of the environment on individual and social well-being, particularly as these influences are mitigated by law.

Suggested Coursework

Biology

BIO 3617 Environmental Law

Economics

ECN 3361 Externalities

ECN 3365 Economics of Urban Transportation

ECN 3366 Economics of Intercity Transportation

Engineering

CIV 3155 Technology Assessment

Political Science

POL 3635 Environment & Energy Policy

Law

LAW 2300 Administrative Law

LAW 2329 Environmental Law

Sociology

SOA 3300 Cultural Ecology

Legal Issues in Health Care

This concentration reflects an increasing concern with health-related issues. Encompassing the legal and social ramifications of such topics as access for the handicapped, rights of medical consumers, health-care regulation, nationalized medicine, and euthanasia, this concentration is designed to foster an interdisciplinary perspective on the many legal issues in health-care delivery in our society.

Suggested Coursework

Economics

ECN 3354 Economics of Medical Care & Health Manpower

Education

CRS 3435 Program Development in Rehabilitation

CRS 3439 Social Welfare and Rehabilitation

CRS 3445 Legal Aspects of Rehabilitation and Special Education

Business

HRM 3784 Human Resource Management in Health Organizations

MGT 3982 Strategic Planning for Health Organizations

Political Science

- POL 3630 Health-Care Administration
- POL 3644 Public Policy Issues in Human Services

Law

- LAW 2339 Involuntary Commitment of the Mentally Ill
- LAW 2358 Welfare

Sociology

- SOC 3245 Sociology of Poverty
- SOC 3200 Sociology of Alcoholism

**Legal Issues in
Human Resources
Utilization**

Legal issues in human resources utilization range from the more traditional problems of fair labor practices and union/management roles and conflicts to more recent problems centering on equal opportunity and affirmative action. This concentration permits examination of these issues as well as questions concerning appropriate education and training policies. This area of study concentrates on legal issues, social consequences, and social responsibility in labor and employment.

*Suggested Coursework***Economics**

- ECN 3350 Economics of the Labor Market and Labor Force I
- ECN 3351 Economics of the Labor Market and Labor Force II
- ECN 3357 Human Resources Planning at State and Local Areas
- ECN 3358 Economics of Education & Training Programs

Education

- ED 3328 Education and Equality

Business

- HRM 3972 Labor Relations
- MGT 3720 Labor Law

Political Science

- POL 3644 Public Policy Issues in Human Services
- POL 3647 Manpower Policy & Administration
- POL 3669 Labor Relations in Public Administration
- POL 3652 Civil Liberties in Public Administration
- POL 3667 Equal Opportunity in Public Administration

Law

- LAW 2340 Labor Law I
- LAW 2341 Labor Law II

Sociology

- SOC 3140 Sociology of Prejudice and Discrimination
- SOC 3175 Sociology of Work
- SOC 3176 Sociology of Occupations and Professions

**Social Policy and
Deviant Behavior**

The parallel problems of crime and deviant behavior have given rise to a vast network of public and private organizations, while calling forth a wide range of policies that influence both

public and private behavior. Concentrating in this area involves an examination of the nature of crime and deviant behavior and the legal and social foundations of policy affecting criminal justice. This concentration should be of value to the scholar interested in exploring the basis of deviance and the role of the criminal justice system, as well as to the administrator who seeks a better foundation for decisions in the criminal justice system.

Suggested Coursework

Criminal Justice

Crime Sequence

CJ 3203 Criminal Law
CJ 3505 Juvenile Law

Deviant Behavior Sequence

CJ 3511 Theories of Delinquency
CJ 3202 Theories of Criminology
CJ 3529 Comparative Criminology
CJ 3354 Criminal Behavior Systems
CJ 3519 Organized Crime
CJ 3517 Terrorism

Sociology

Crime Sequence

SOC 3205 Sociology of Crime and Justice
SOC 3190 Sociology of Delinquency
SOC 3405 Theories of Criminology

Deviant Behavior Sequence

SOA 3220 Culture and Mental Illness
SOC 3185 Sociology of Deviant Behavior
SOC 3200 Sociology of Alcoholism

Law

Crime Sequence

LAW 2337 Juvenile Law
LAW 2351 Prisoners' Rights

Deviant Behavior Sequence

LAW 2339 Involuntary Commitment of the Mentally Ill

Economics

Crime Sequence

ECN 3362 Economics of Crime

Education

Deviant Behavior Sequence

ED 3306 Abnormal Psychology
CRS 3406 Mental Health

Psychology

Crime and Deviant Behavior Sequence

PSY 3324 Behavior Change in Institutions
PSY 3171 Psychopathology I
PSY 3271 Psychopathology II

Mathematics

The graduate program in mathematics is structured to provide the opportunity for students to gain a strong general foundation and proficiency in a particular area of specialization. Those who are admitted to the doctoral program find a versatile and active research faculty able to direct them in a variety of original research topics. The mathematical life at Northeastern University is often enlightened by the visit of eminent mathematicians to the University or to the Greater Boston area. Numerous departmental and regional seminars also give the student an opportunity to learn of the most recent and important advances in modern mathematics.

Professors

Maurice E. Gilmore, *PhD, University of California, Berkeley,*
Chairperson

Samuel J. Blank, *PhD, Brandeis University*

Bohumil Cenkľ, *DSc, Charles University, Prague, Czechoslovakia*

David I. Epstein, *PhD, New York University*

Holland C. Filgo, Jr., *PhD, Rice University*

Alberto R. Galmarino, *PhD, Massachusetts Institute of Technology*

Arshag Hajian, *PhD, Yale University*

Evelyn F. Keller, *PhD, Harvard University*

Nancy Kopell, *PhD, University of California, Berkeley*

Jayant M. Shah, *PhD, Massachusetts Institute of Technology*

Gabriel Stolzenberg, *PhD, Massachusetts Institute of Technology*

Jack Warga, *PhD, New York University*

Associate Professors

Shirley A. Blackett, *MEd, Pennsylvania State University*

Mark Bridger, *PhD, Brandeis University*

Gail A. Carpenter, *PhD, University of Wisconsin*

Bruce Claflin, *MS, Northeastern University*

Margaret Cozzens, *PhD, Rutgers University*

Ron Donagi, *PhD, Harvard University*

John N. Frampton, *PhD, Yale University*

Terence Gaffney, *PhD, Brandeis University*

Mark Goresky, *PhD, Brown University*

Eugene H. Gover, PhD, *Brandeis University*
 Samuel Gutmann, PhD, *Massachusetts Institute of Technology*
 Anthony Iarrobino, PhD, *Massachusetts Institute of Technology*
 Solomon M. Jekel, PhD, *Dartmouth College*
 Nishan Krikorian, PhD, *Cornell University*
 Robert C. McOwen, PhD, *University of California, Berkeley*
 Richard D. Porter, PhD, *Yale University*
 Mark B. Ramras, PhD, *Brandeis University*
 Thomas O. Sherman, PhD, *Massachusetts Institute of Technology*
 Chuu-Lian Terng, PhD, *Brandeis University*

Assistant Professors

Margaret M. Bayer, PhD, *Cornell University*
 David Bernstein, PhD, *University of Maryland*
 Robert W. Case, PhD, *Yeshiva University*
 Mo-Suk Chow, PhD, *Cornell University*
 Dom P. de Caen, PhD, *University of Toronto, Canada*
 Stanley J. Eigen, PhD, *McGill University, Montreal, Canada*
 Lenore Feigenbaum, PhD, *Yale University*
 Laurence S. Gillick, PhD, *Massachusetts Institute of Technology*
 Donald R. King, PhD, *Massachusetts Institute of Technology*
 Marc N. Levine, PhD, *Brandeis University*
 Zakhar G. Maymin, PhD, *Massachusetts Institute of Technology*
 Maria I. Platzeck, PhD, *Brandeis University*
 A. Prabhakar Rao, PhD, *University of California, Berkeley*
 Catherine Roche, PhD, *Northeastern University*
 Martin Schwarz, Jr., PhD, *New York University, Courant*
 Joel A. Stein, PhD, *Harvard University*
 Barbara Tabak, PhD, *University of California, Berkeley*
 Gordana G. Todorov, PhD, *Brandeis University*

Research

For the last several years, the Mathematics Department has established as priorities for the hiring of new research faculty the areas of statistics and applied algebra and analysis. Besides the important research studies being conducted in those fields, the department has strong and active research mathematicians in a variety of other areas. Below is a partial list of current research areas and some of the studies being undertaken. The order roughly follows that adopted by the *Mathematical Reviews*. The list constitutes a rich cross section of the whole mathematics.

- Foundations: Study of constructive mathematics.
- Combinatorics: Studies in applications of graph theory techniques to problems in such diverse areas as computer science, biology, psychology, and management science. Study of computer implementation of algorithms arising in topology.

- Commutative algebra: Study of Artin algebras.
- Algebraic geometry: Study of Hodge theory and moduli problems. Study of moduli of stable rank-two bundles on P^3 .
- Lie theory: Structure and representation of Weyl groups. Noncommutative harmonic analysis on symmetrical spaces.
- Measure theory: Studies of ergodic theory.
- Optimal control theory: Studies of optimization and non-smooth analysis. (A faculty member is a member of the board of the *SIAM Journal on Control and Optimization*.)
- Partial differential equations: Study of elliptical partial differential equations on noncompact domains and manifolds.
- Differential geometry: Study of variational problems in differential geometry (minimal submanifolds, Einstein metric). Study of differential forms with applications to group lie algebras and their cohomologies. Study of Bäcklund transformations of chiral fields on Grassman and Stiefel manifolds.
- Algebraic topology: Tame homotopy theory.
- Statistics: Studies of statistical decision theory, pattern recognition, and industrial applications of statistics.
- Applied analysis: Studies of reaction-diffusion equations, spontaneous pattern formation in physics and chemistry, forced and complex oscillators, and theoretical neurobiology.

Admissions Requirements

Applicants for admission must satisfy the admissions requirements listed on page 19. In addition, they should have a background that includes courses in linear and modern algebra, mathematical analysis, and computer programming.

Students who have deficiencies in these areas may be accepted if their overall college work is judged satisfactory. However, they will be expected to learn the material during the first two quarters. Some of the courses may be taken at Northeastern University during the summer preceding enrollment. Students may also choose to enroll in the introductory courses or make individual arrangements with their advisers.

The Master of Science Degree

The Mathematics Department offers a program of study leading to the ms degree in mathematics. The program allows students the opportunity to pursue the option of an internship in one of the many high-technology industries and research laboratories located in the Boston area.

Areas of specialization are:

Applied mathematics
Computer science
Analysis/differential equations
Numerical analysis
Combinatorics
Topology/geometry
Algebra
Probability and statistics

Course Requirements Twelve 4 QH graduate courses (for a total of 48 QH) are required for the degree.

The three required courses are:

Analysis I
Algebra I (Linear Algebra)
Data Structures

Students must select six of the following courses, at least one of which must be among the first three listed:

Analysis II (Complex Variables)
Algebra II (Groups and Rings)
Computer Organization and Programming
Combinatorics (any one of three)
Analysis III
Topology I or Geometry (Foundations of)
Applied Mathematics (I or II, not both)
Differential Equations (P.D.E. or O.D.E. not both)
Probability I
Statistics I
Numerical Analysis I
A theoretical computer science course
An elective in the specialty
An elective not in the specialty

Three advanced courses are required in the specialty area: for example, students might take three advanced courses in:

Combinatorics/discrete mathematics
Computer science
Probability/statistics
Topology/geometry
Analysis
Algebra
Applied mathematics

Nearly all graduate courses in the Mathematics Department meet after 5 p.m., Monday to Thursday, so that students who

work during the day may take one or two courses each quarter at night.

After completing the ms degree, a student with an excellent academic record may apply for admission to Northeastern's PhD program in mathematics.

Part-Time Program Students in this program may progress according to their abilities and available time, subject, of course, to the time limitation established by the Graduate School of Arts and Sciences. Students who are deficient in any of the mathematics courses required for admission to the degree program are required to satisfy their deficiencies by taking courses given for this purpose. Such courses carry graduate credit, but that credit is regarded as additional to regular degree requirements.

Other Requirements There are no comprehensive examinations and no language requirements for the ms degree.

The Doctor of Philosophy Degree

Admission Students who have completed the full-time master's degree program or who have obtained a master's degree at another institution are eligible for admission to the doctoral program. Students who wish to earn the doctoral degree should inform the chairperson of the graduate committee of their desire to be doctoral candidates. Those who have been accepted as doctoral candidates will remain in that category as long as their progress is deemed satisfactory.

Residence Requirement The residence requirement is satisfied by one year of full-time graduate work.

Degree Candidacy Degree candidacy is established in accordance with the general Graduate School regulations.

Course Requirements The course requirements, in addition to the minimum master's degree requirement of forty-eight quarter hours of credit, are established by the departmental graduate committee for each candidate. In most cases, thirty-two quarter hours of additional work is required.

Independent Work Before starting their dissertation, doctoral students may be required to do an independent project, possibly but not necessarily in conjunction with departmental seminars or courses. The aim of the project is to start students on independent work and

to give them a practical way to learn research techniques. The ms thesis is acceptable, for example.

Minor Specialty

Each doctoral candidate selects some specific mathematical subject of an advanced nature, which must be reasonably unrelated to the topic of the student's dissertation. By means of reading, lecture courses, and/or seminars, the student should render work in this area equivalent to a good part of one full year's coursework (twelve quarter hours). Approval of the area and the plan of work should be obtained in advance from the departmental graduate committee.

**Language
Requirements**

Ability to read and translate mathematical texts and journals in one foreign language must be established by the candidate. The language may be chosen from French, German, and Russian; any other choice requires special approval. Students should notify the chairperson of the departmental graduate committee when they are prepared to be examined on a language. The examination is conducted by a member of the faculty of the Mathematics Department.

**Teaching
Requirement**

Some teaching experience is required. This requirement may be satisfied by at least one year of service as a teaching assistant or by suitable teaching duties.

Dissertation

After the successful completion of their independent work (when required), students select a dissertation adviser, under whose guidance they write their doctoral dissertations. They may be assisted by the departmental graduate committee in that selection if they wish. The dissertation itself must represent an original solution of a problem in the chosen area of mathematics that makes some contribution to mathematical knowledge.

**Final Oral
Examination**

The final oral examination on the dissertation is held in accordance with the Graduate School regulations.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

The following course is offered for those who wish to enter the master's degree program in mathematics but who fail to

satisfy the admission requirements. This course is taken in addition to the required coursework in mathematics.

MTH 3020 Basics of Analysis

2 QH

The following courses may be used toward the degree requirements in mathematics, except for courses numbered from MTH 3200 to MTH 3299.

MTH 3101	Analysis I	4 QH
MTH 3102	Algebra I	4 QH
MTH 3103	Analysis II	4 QH
MTH 3104	Algebra II	4 QH
MTH 3105	Topology I	4 QH
MTH 3106	Analysis III	4 QH
MTH 3107	Topology II	4 QH
MTH 3222	Applied Statistics	4 QH
MTH 3224	Biostatistics	3 QH
MTH 3230	Introduction to Computer Programming and Applications	2 QH
MTH 3231	Introduction to Computer Programming and Applications	4 QH
MTH 3234	Pascal	3 QH
MTH 3302	Constructive Algebra	4 QH
MTH 3303	Set Theory	4 QH
MTH 3305	Philosophy of Science and Mathematics I	4 QH
MTH 3306	Philosophy of Science and Mathematics II	4 QH
MTH 3311	Mathematical Logic	4 QH
	This course combines material of MTH 3011 and MTH 3013.	
MTH 3321	Algebra III	4 QH
MTH 3331	Homological Algebra	4 QH
MTH 3332	Commutative Algebra	4 QH
MTH 3341	Applied Mathematics I	4 QH
MTH 3342	Applied Mathematics II	4 QH
MTH 3351	Ordinary Differential Equations I	4 QH
MTH 3353	Partial Differential Equations	4 QH
MTH 3361	Numerical Analysis I	4 QH
MTH 3362	Numerical Analysis II	4 QH
MTH 3371	Optimal Control Theory	4 QH
MTH 3373	Optimization	4 QH
MTH 3386	Lie Theory	4 QH
MTH 3400	Foundations of Geometry	4 QH
MTH 3411	Differential Geometry	4 QH
MTH 3414	Geometry & Mechanics	4 QH
MTH 3415	The Inverse Scattering Transform	4 QH
MTH 3431	Probability I	4 QH
MTH 3432	Probability II	4 QH
MTH 3441	Statistics I	4 QH
MTH 3443	Statistical Decision Theory	4 QH
MTH 3444	Analysis of Variance	4 QH
MTH 3445	Topics in Statistics	4 QH
MTH 3448	Nonparametric Methods in Statistics	4 QH
MTH 3450	Categorical Data Analysis	4 QH
MTH 3460	Pattern Recognition	4 QH
MTH 3501	Data Structures	4 QH
MTH 3502	Computer Organization and Assembly Programming	4 QH
MTH 3503	Compilers	4 QH
MTH 3514	Efficient Algorithms	4 QH
MTH 3521	Theory of Automata and Formal Language	4 QH
MTH 3522	Artificial Intelligence	4 QH

Course No.	Course Name	Credit
MTH 3524	Discrete Mathematical Models	4 QH
MTH 3527	Combinatorics I (Enumeration)	4 QH
MTH 3528	Combinatorics II (Coding Theory & Block Designs)	4 QH
MTH 3529	Graph Theory	4 QH
MTH 3530	Topics in Combinatorics	4 QH
MTH 3535	Algorithms and Complexity Theory	4 QH
MTH 3801	Seminar: Constructive Mathematics	4 QH
MTH 3806	Readings in Algebra	4 QH
MTH 3807	Seminar in Algebra	4 QH
MTH 3811	Readings in Analysis	4 QH
MTH 3812	Seminar in Analysis	4 QH
MTH 3818	Seminar: Dynamical Systems	4 QH
MTH 3821	Readings in Topology	4 QH
MTH 3822	Seminar in Topology	4 QH
MTH 3826	Readings in Statistics and Probability	4 QH
MTH 3827	Seminar in Statistics	4 QH
MTH 3836	Seminar in Combinatorics	4 QH
MTH 3850	Doctoral Dissertation	0 QH
MTH 3799	Doctoral Dissertation Continuation	0 QH

Physics

The Northeastern University Department of Physics offers opportunities for graduate students to work with internationally recognized faculty in a diverse range of front-line research programs in atomic and molecular physics, astrophysics, biophysics, condensed matter physics, and elementary particle physics.

The department offers both full- and part-time graduate programs leading to the MS degree and full-time programs leading to the PhD degree. Thesis work for the PhD degree may be undertaken in one of the department's research areas or in interdisciplinary areas such as material science and plasma physics. An additional option allows cooperative research in applied physics, in which the PhD thesis work is undertaken in a high-technology, medical, or nonprofit institution in the Boston area.

Professors

Robert P. Lowndes, PhD, *University of London*, Chairperson

Ronald Aaron, PhD, *University of Pennsylvania*

Petros N. Argyres, PhD, *University of California, Berkeley*

Richard L. Arnowitt, PhD, *Harvard University*

Alan H. Cromer, PhD, *Cornell University*

William L. Faissler, PhD, *Harvard University*

Marvin H. Friedman, PhD, *University of Illinois, Urbana*

David A. Garelick, PhD, *Massachusetts Institute of Technology*

Marvin W. Gettner, PhD, *University of Pennsylvania*

Michael J. Glaubman, PhD, *University of Illinois, Urbana*

Hyman Goldberg, PhD, *Massachusetts Institute of Technology*

Walter Hauser, PhD, *Massachusetts Institute of Technology*

Giovanni Lanza, PhD, *University of Trieste*

Bertram J. Malenka, PhD, *Harvard University*

Pran Nath, PhD, *Stanford University*

Clive H. Perry, PhD, *University of London*

Stephen Reucroft, PhD, *University of Liverpool*

Eugene J. Saletan, PhD, *Princeton University*

Carl A. Shiffman, PhD, *Oxford University*

Jeffrey B. Sokoloff, PhD, *Massachusetts Institute of Technology*

Yogendra N. Srivastava, PhD, *Indiana University*

Michael T. Vaughn, PhD, *Purdue University*

Eberhard von Goeler, PhD, *University of Illinois, Urbana*
Allan Widom, PhD, *Cornell University*
Fa Yueh Wu, PhD, *Washington University*

Associate Professors

Arun Bansil, PhD, *Harvard University*
Paul M. Champion, PhD, *University of Illinois, Urbana*
Jorge V. Jose, DSc, *National University of Mexico*
Marie Machacek, PhD, *University of Iowa*
Robert S. Markiewicz, PhD, *University of California, Berkeley*

Assistant Professors

George O. Alverson, PhD, *University of Illinois, Urbana*
Sara C. Beck, PhD, *University of California, Berkeley*
Narendra K. Jaggi, PhD, *University of Bombay*
Jacqueline Krim, PhD, *University of Washington, Seattle*
Mark Novotny, PhD, *Stanford University*
Robert Polvado, PhD, *Indiana University*
Lou Reinisch, PhD, *University of Illinois, Urbana*

Research Associates

Henry Band, PhD, *Duke University*
Rajan Gupta, PhD, *California Institute of Technology*
Sahadat Hossain, PhD, *Tufts University*
Jorge H. Moromisato, PhD, *Northeastern University*

Areas of Advanced Study and Research

Astrophysics

The research of this group includes observational and experimental work using spectroscopic and continuum measurements at infrared and radio wavelengths. Topics of study include galactic and extragalactic regions of star formation, pre-main-sequence outflow sources, mass loss in evolved stars, infrared-bright galaxies, and planetary atmospheres. Research is conducted at some of the world's major astronomical facilities including the NASA Infrared Telescope Facility at Mauna Kea, Hawaii, and the NROA Very Large Array, Tucson, Arizona.

Biomolecular Physics

The biomolecular physics group is engaged in a variety of experimental programs in order to better understand the structure and function of biological molecules. Currently, heme containing proteins, such as hemoglobin, myoglobin, cytochrome-c and cytochrome P-450, are being investigated to help answer fundamental questions involving electron transport in biomolecules, the binding and release of small molecules to proteins and enzyme catalysis.

The primary techniques utilized in these studies involve laser light scattering. Both the inelastic (RAMAN) and the elastic (RAYLEIGH) light scattering are monitored in order to gain information about inner-molecular motions ranging from the very slow (classical) to the very fast (quantum mechanical) time regime. Large magnetic fields are also utilized in order to probe the effect of spin state changes of the heme iron atom on the biological reaction rates.

Experimental Condensed Matter Physics

Researchers in this area use a broad range of in-house experimental techniques, such as far infrared and laser Raman spectroscopy, and high-pressure and low-temperature devices, including superconducting quantum interference devices (SQUIDS). Researchers are also involved off campus in high magnetic field studies at the National Magnet Laboratory and in neutron spectroscopy studies at the Brookhaven and Oak Ridge National Laboratories.

Current research topics include surface physics; infrared and optical studies of semiconductors; metals and metallic glasses as a function of temperature and pressure; transport phenomena in metals and semiconductors in low to very high magnetic fields; pressure dependence of electron-phonon scattering rates; x-ray, optical, and Fermi surface studies of intercalated graphite; two-dimensional physics and localization in ultrathin metallic films; magneto-optical studies of two-dimensional electron superlattices and single interfaces; neutron scattering in two-dimensional magnetic systems and in weakly itinerant ferromagnets; infrared, Raman, and neutron spectroscopy of fast ion conductors; and intermolecular interactions in fluids at high densities.

Theoretical Condensed Matter Physics

Research interests of this group include statistical mechanics; theory of phase transitions; low-temperature physics; theory of Josephson junctions; quantum circuits; quantum optics; Fermi liquid theory; localization and percolation in disordered systems; soliton and chaotic solutions of nonlinear systems; charge density waves; magnetism; electromagnetic and elastic properties of solids, optical properties of metals; transport theory; quantum chaos; and transport properties of disordered systems.

Experimental High-Energy Physics

The high-energy experimental group is presently taking part in three major experimental efforts at three different centers for high-energy physics. One group is collecting and analyzing data from the magnetic calorimeter (MAC) that is in operation at

the electron-positron colliding beam facility (PEP) at Stanford University. A second group is participating in the construction of a large multi-particle spectrometer, which will be used in one of the first experiments to be run at the Tevatron now being built at the Fermi National Accelerator Laboratory. This detector will have excellent photon-detecting ability and will be used to carry out several experimental tests of quantum chromodynamics. A third group is participating in the construction of a large experiment to run at the electron-positron colliding beam facility (LEP) being built at CERN in Geneva, Switzerland. When this facility goes into operation, it will be the leading electron-positron facility in the world.

Theoretical Elementary Particle Physics

Research interests cover a range of topics, including unified gauge theories of weak, electromagnetic, and strong interactions; particle physics in the early universe; phenomenology of supersymmetrical models; supergravity unified models; lattice gauge theory; computational physics, phase transitions and spontaneous symmetry breaking; finite temperature effects in quantum chromodynamics; renormalization group analyses of coupled field systems; and phenomenology of high-energy physics.

Research Facilities

The department is housed in the Dana Research Center, a modern, air-conditioned building with its own library, ample research laboratories, a machine and electronics shop, conference and seminar rooms, and faculty and graduate student offices. The department has its own VAX 11/750 computer facility, as well as facilities providing access to the University Computer Center.

Faculty and graduate students are also currently engaged in a variety of experiments off campus: in astrophysics at the NASA Infrared Telescope Facility, the Kitt Peak National Observatory, and the NRAO Very Large Array, in condensed matter experiments at the National Magnet Laboratory, the Brookhaven National Laboratory, the Oak Ridge National Laboratory, and the Laue-Langevin Institute, Grenoble, France, and in high-energy experiments at the Fermi National Accelerator Laboratory (Fermilab), the Stanford Linear Accelerator Center (SLAC), and at the Large Electron Positron (LEP) collider facility at CERN, Geneva.

Procedure for Admission

All requests for information and application forms should be sent to the graduate coordinator of the Physics Department. Completed applications and related materials, such as tran-



scripts, letters of recommendation, and Test of English as a Foreign Language (TOEFL) scores (where applicable) should also be sent to the graduate director. Graduate Record Examination (GRE) scores should be sent to the Graduate School of Arts and Sciences office.

In addition to meeting the general requirements of the Graduate School of Arts and Sciences, applicants for admission to the graduate programs must have had an undergraduate program that included the equivalent of at least twelve semester hours of upperclass physics beyond general physics and courses in calculus and ordinary differential equations.

To qualify as a regular student, the applicant should have completed upperclass courses in mechanics, electricity and magnetism, thermodynamics, modern physics, and quantum mechanics, as well as mathematical methods courses covering advanced calculus, linear vector spaces, and functions of a complex variable. Students whose background in one or more of these areas is weak may be required to satisfy prerequisites to the graduate courses by completing up to nine quarter hours of introductory courses.

Students with undergraduate majors in fields other than physics may be admitted as provisional students, with entry to the regular program conditional upon the satisfactory completion of an appropriate group of undergraduate courses. Except for the introductory courses, these courses do not carry regular graduate credit.

The applicant is encouraged to take the GRE (both the aptitude section and the advanced physics section); scores should be sent to the Graduate School of Arts and Sciences office.

International students are required to present evidence of sufficient competence in the English language to pursue the graduate program. For students whose previous instruction has been in a language other than English, this is normally done by submitting to the Physics Department results of the TOEFL examination or other evidence in accordance with the Graduate School regulations.

Assistantships

A number of assistantships are available for full-time graduate students.

Teaching Assistantships

These awards offer a stipend plus a remission of tuition for a regular graduate courseload in exchange for half-time work teaching in the undergraduate laboratories or equivalent work.

Tuition Assistantships

These awards provide remission of tuition for a regular graduate courseload in exchange for approximately eight hours per

week of grading assignments or similar work. Holders of these awards are eligible to become teaching assistants if such positions become available.

Research Assistantships

These awards, normally given to advanced students, provide the same benefits as teaching assistantships in exchange for work (usually related to the student's thesis research) on one of the research projects in the department.

Physics Fellowships

The Physics Department awards four physics fellowships annually to students judged to be outstanding scholastically. These fellowships carry with them an honorarium, which is received in addition to the teaching or research assistantship stipend.

The Programs

The graduate programs in physics lead to the degrees of doctor of philosophy (PhD) and master of science (MS). In addition, the MS degree can be obtained with a concentration in instrumentation or a concentration in optics. The PhD program requires a full-time commitment, but the MS programs can be pursued on either a full-time or a part-time basis.

Each student admitted to the graduate program must be interviewed by a departmental adviser before registration for the first quarter at Northeastern, in order to assess the student's background and arrange for a suitable program of study.

The Master of Science Degree

Course Requirements

There are three options for the MS degree: the standard MS, the MS with a concentration in instrumentation, and the MS with a concentration in optics. Irrespective of the option chosen, forty-two quarter hours of graduate credit are required for the MS degree, of which up to twelve quarter hours may be transfer credit on departmental approval (subject to the general regulations of the Graduate School).

The MS degree options involve a common set of physics graduate courses, consisting of the following:

PHY 3601	Mathematical Methods A
PHY 3603	Classical Mechanics
PHY 3611, PHY 3612	Electromagnetic Theory A, B
PHY 3621, PHY 3622	Quantum Theory A, B

In addition to these required core courses, the three degree options have the following additional requirements:

MS (Standard Degree)

PHY 3605
PHY 3623

Computational Physics
Quantum Theory C

The remaining twelve quarter hours may be chosen from any courses carrying graduate credit in physics, biology, chemistry, engineering, mathematics, or psychology. Of these twelve quarter hours, not more than nine quarter hours of credit may be used in approved introductory physics courses (PHY 1305, Thermodynamics and Kinetic Theory; PHY 1412, Plasma Physics; PHY 1413, Introduction to Nuclear Physics; PHY 1414, Introduction to Solid State Physics; PHY 1415 and PHY 1416, Quantum Mechanics I and II; and PHY 3551 and PHY 3552, Electronics for Scientists I and II).

MS with a Concentration in Instrumentation

PHY 3605
PHY 3551, PHY 3552
PHY 3557
PHY 3561

Computational Physics
Electronics for Scientists I and II
Advanced Laboratory
Project Laboratory

MS with a Concentration in Optics

PHY 3623

Quantum Theory C

In addition, students must take twelve quarter hours of credit from the following courses:

ECE 3511, ECE 3512	Lasers I, II
ECE 3513	Laser Applications
ECE 3661	Optical Storage and Display
ECE 3662, ECE 3663	Electro Optics I, II
ECE 3664, ECE 3665, ECE 3666	Fourier Optics I, II, III
ECE 3667, ECE 3668, ECE 3669	Optical Properties of Matter I, II, III
ECE 3672, ECE 3673	Principles of Optical Detectors I, II

The remaining four quarter hours may be chosen from any courses carrying graduate credit in physics or from optics-related courses.

Sample Course Program for Part-Time Students for Standard MS Degree

	Fall	Winter	Spring
Year I	Elective	PHY 1415 Quantum Mechanics I	PHY 1416 Quantum Mechanics II
Year II	PHY 3601 Mathematical Methods A	PHY 3603 Classical Mechanics	PHY 3605 Computational Physics
Year III	PHY 3611 Electromagnetic Theory A	PHY 3612 Electromagnetic Theory B	Elective*
Year IV	PHY 3621 Quantum Theory A	PHY 3622 Quantum Theory B	PHY 3623 Quantum Theory C

A part-time student can expect to complete the requirements for the MS degree in four years at the rate of one three- or four-quarter hour course per quarter, or sooner by taking extra

*Students intending to enter the PhD program should take PHY 3613, Electromagnetic Theory C, in the spring quarter.

courses in some years or by taking courses in the summer quarter.

The Doctor of Philosophy Degree

The program for the PhD degree consists of required coursework, a qualifying examination, the completion of a dissertation based upon original research performed by the student, and a final oral examination.

Course Requirements

The required courses are grouped into two sets: part 1 and part 2. Part 1 courses are taken prior to the qualifying examination, and part 2 courses are taken after passing the qualifying examination. In addition, it is strongly recommended that at least one advanced graduate course from the set in part 3 be taken after the satisfactory completion of the part 2 courses; at his/her option, a student may take the part 3 courses on a pass/fail basis.

The three sets of courses are as follows:

Part 1

PHY 3601	Mathematical Methods A
PHY 3603	Classical Mechanics
PHY 3605	Computational Physics
PHY 3611, PHY 3612, PHY 3613	Electromagnetic Theory A, B, C
PHY 3621, PHY 3622, PHY 3623	Quantum Theory A, B, C

Part 2

PHY 3624	Advanced Quantum
PHY 3631, PHY 3632, PHY 3633	Statistical Physics A, B, C
PHY 3641, PHY 3642	Solid State Physics A, B
PHY 3651, PHY 3652	Particle & Nuclear A, B

Part 3

PHY 3643, PHY 3644, PHY 3645	Advanced Solid State Physics A, B, C
PHY 3653, PHY 3654, PHY 3655	Particles, Currents & Fields A, B, C
PHY 3661, PHY 3662, PHY 3663	Many Body A, B, C
PHY 3671, PHY 3672, PHY 3673	General Relativity; Relativistic Astrophysics; Quantum Gravity

Sample Course Program for Full-Time Students*

	Fall	Winter	Spring
Year I	PHY 3601 Mathematical Methods A PHY 3611 Electromagnetic Theory A PHY 3621 Quantum Theory A	PHY 3603 Classical Mechanics PHY 3612 Electromagnetic Theory B PHY 3622 Quantum Theory B	PHY 3605 Computational Physics PHY 3613 Electromagnetic Theory C PHY 3623 Quantum Theory C
Year II	PHY 3631 Statistical Physics A PHY 3624 Advanced Quantum	PHY 3632 Statistical Physics B PHY 3651 Particle & Nuclear A PHY 3641 Solid State Physics A	PHY 3633 Statistical Physics C PHY 3652 Particle & Nuclear B PHY 3642 Solid State Physics B

*A student who is required to take one or more introductory courses to satisfy prerequisites will normally need three years to complete the required courses for the PhD. Individual programs must be worked out in consultation with a departmental adviser.

Grade Requirements

The grade requirements for the successful completion of part 1, and hence for entry into the qualifying examination, are at least a B average in the part 1 courses. The grade requirements for the successful completion of part 2, and hence for formal entry into the thesis research, are at least a B average in the part 2 courses.

The part 2 courses, including any makeup of grade average deficiencies (see below), must be completed within two calendar years of passing the qualifying examination. Under mitigating circumstances, a student may petition the Committee on Academic Standing of Graduate Students (CASGS) to extend this time limit. Such a petition must be filed and approved by CASGS before the required two-year period from the successful completion of the qualifying examination has elapsed in order for the student to remain in the graduate program.

In the event that a student fails to achieve the required B average for the part 1 courses, he/she must petition CASGS in order to remain in the graduate program. After carefully reviewing the academic performance of any student filing such a petition, CASGS will either not approve the petition or will place the student on academic probation pending the successful completion of a program established by CASGS for the student to clear his/her grade average deficiency.

In the event that a student fails to achieve the required B average for the part 2 courses, he/she must petition CASGS in order to remain in the graduate program. The final decision of CASGS will then be determined by the result of a special examination in the course(s) determined by CASGS to be the most serious contribution(s) to the grade average deficiency. Whenever possible, the examination(s) will be prepared and graded by the student's instructor(s) in the course(s) concerned.

Qualifying Examination

In addition to the grade requirements described above, the qualifying examination is also a requirement for the PhD degree. The qualifying examination, which may include both written and oral parts, will be based only on the material covered in the part 1 courses. The examination will be given only once each year, in the orientation week immediately preceding the fall quarter. A student may have only two attempts to pass the qualifying examination. In the event that a student fails the qualifying examination twice, he/she will automatically be terminated from the graduate program.

All students who have completed part 1 courses with a B average or who have successfully completed an academic probation program established by CASGS are eligible to take the qualifying examination and must take the examination at the

first available opportunity. Upon successful completion of the qualifying examination requirement, a student must acquire a research adviser.

Part-time students who wish to become PhD candidates may so indicate by a petition to the graduate committee of the department; the petition must include a timetable for completing the required courses and taking the qualifying examination.

Advanced Standing

A student may be admitted into the PhD program with advanced standing based upon graduate courses taken elsewhere. Transfer credit will depend on departmental approval (subject to the general regulations of the Graduate School). However, the PhD qualifying examination must be taken at Northeastern, and the residence requirement must be satisfied.

Residence Requirement

A student who has completed the required coursework and passed the qualifying examination becomes a doctoral degree candidate and must satisfy the residence requirement by one year of full-time graduate work.

Teaching Requirement

Some teaching experience is required. This requirement may be satisfied by at least one year of service as a teaching assistant or by other teaching duties.

Work-Study Option

A PhD candidate may spend one year in a participating high-technology, industrial, or government laboratory immediately after passing the PhD qualifying examination. In this program, the student is expected to remain in touch with the University by taking one course per quarter at the University and by frequent contact with a faculty adviser. After the one-year paid internship, the student returns to the University to do the dissertation.

Eligibility for this program is contingent on acceptance both by the department and by the external laboratory involved.

Dissertation

The student should arrange for a dissertation adviser prior to taking the qualifying examination.

The student may choose a field of research:

- In one of the research areas in the department, under direct supervision of the adviser.
- In an interdisciplinary research field involving another research area of the University, under the direct supervision of a researcher in that field. In this case, an interdisciplinary committee is formed, consisting of the direct supervisor, the departmental adviser, and one other member of the department.

- In an area of applied research in one of the industrial or high-technology laboratories associated with the department's industrial PhD program. The direct supervisor is associated with the institution where the research is performed. In this case, a dissertation advisory committee is established consisting of the direct supervisor, the departmental adviser, and one other member of the department.

An outline of the dissertation must be approved by the department at least eight months before the final oral examination.

Final Oral Examination

The final oral examination is held in accordance with the Graduate School regulations.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
PHY 3401	Radiation Physics	2 QH
PHY 3402	Radiation Biology	2 QH
PHY 3551	Electronics for Scientists I	4 QH
PHY 3552	Electronics for Scientists II	4 QH
PHY 3557	Graduate Advanced Laboratory	4 QH
PHY 3561	Graduate Project Laboratory	4 QH
PHY 3601	Mathematical Methods A	4 QH
PHY 3602	Mathematical Methods B	4 QH
PHY 3603	Classical Mechanics	4 QH
PHY 3605	Computational Physics	4 QH
PHY 3611	Electromagnetic Theory A	3 QH
PHY 3612	Electromagnetic Theory B	3 QH
PHY 3613	Electromagnetic Theory C	3 QH
PHY 3621	Quantum Theory A	4 QH
PHY 3622	Quantum Theory B	4 QH
PHY 3623	Quantum Theory C	4 QH
PHY 3624	Advanced Quantum Theory	4 QH
PHY 3631	Statistical Physics A	3 QH
PHY 3632	Statistical Physics B	3 QH
PHY 3633	Statistical Physics C	3 QH
PHY 3641	Solid State Physics A	4 QH
PHY 3642	Solid State Physics B	4 QH
PHY 3643	Advanced Solid State Physics A	4 QH
PHY 3644	Advanced Solid State Physics B	4 QH
PHY 3645	Advanced Solid State Physics C	4 QH
PHY 3651	Particle & Nuclear A	4 QH
PHY 3652	Particle & Nuclear B	4 QH
PHY 3653	Fields, Particles and Currents A	4 QH
PHY 3654	Fields, Particles and Currents B	4 QH
PHY 3655	Fields, Particles and Currents C	4 QH
PHY 3661	Many Body Theory A	4 QH
PHY 3662	Many Body Theory B	4 QH

Course No.	Course Name	Credit
PHY 3663	Many Body Theory C	4 QH
PHY 3671	Foundations of General Relativity	4 QH
PHY 3672	Relativistic Astrophysics and Cosmology	4 QH
PHY 3673	Quantum Gravity	4 QH
PHY 3811	Reading Course	1 QH
PHY 3812	Reading Course	1 QH
PHY 3813	Reading Course	1 QH
PHY 3821	Reading Course	2 QH
PHY 3822	Reading Course	2 QH
PHY 3823	Reading Course	2 QH
PHY 3831	Reading Course	3 QH
PHY 3832	Reading Course	3 QH
PHY 3833	Reading Course	3 QH
PHY 3841	Reading Course	4 QH
PHY 3842	Reading Course	4 QH
PHY 3843	Reading Course	4 QH
PHY 3890	Master's Thesis I	4 QH
PHY 3891	Master's Thesis II	4 QH
PHY 3895	Doctoral Dissertation	0 QH
PHY 3798	Master's Thesis Continuation	0 QH
PHY 3799	Doctoral Dissertation Continuation	0 QH

Political Science

Although it is one of the oldest disciplines, political science is one of the most recently developed social sciences. As a discipline, political science entails the study of the origins, structures, and evolution of governments; the decision-making processes of political institutions; the means by which governments seek to manage conflicts; and the ways in which governments ought to be constituted and function.

Political science adopts the scientific, or quantitative, approach, when appropriate, yet is also concerned with historical developments, institutional descriptions, political trends, and normative values. In a very real sense, it is a blend of the oldest and newest methodologies and draws on other relevant disciplines to further its research and development.

Professors

Robert E. Gilbert, PhD, *University of Massachusetts, Chairperson*

Robert L. Cord, PhD, *Syracuse University*

David E. Schmitt, Edward W. Brook Professor, PhD, *University of Texas*

Associate Professors

L. Gerald Bursey, PhD, *Harvard University*

Minton F. Goldman, PhD, *Fletcher School of Law and Diplomacy*

Eileen L. McDonagh, PhD, *Harvard University*

Suzanne Ogden, PhD, *Brown University*

Assistant Professors

Stephen F. Coleman, PhD, *Boston University*

Malcolm L. Cross, PhD, *University of Missouri*

David A. Dickson, PhD, *Harvard University*

Margaret E. Leahy, PhD, *University of Southern California*

William F. S. Miles, PhD, *Fletcher School of Law and Diplomacy*

Stewart Reiser, PhD, *Harvard University*

David Rochefort, PhD, *Brown University*

Harry Wessel, PhD, *State University of New York, Buffalo*

Lecturer

Christopher J. Bosso, MA, *University of Pittsburgh*

Part-Time Faculty

Rev. Edward F. Boyle, MBA, *Amos Tuck School of Business Administration*

Holly M. Carter, PhD, *Massachusetts Institute of Technology*

Ernest W. Cook, PhD, *Ohio State University*

Maxim Dem'Chak, MPA, *Northeastern University*

Gavan Duffy, SM, *Massachusetts Institute of Technology*

Richard M. Gladstone, MCP, *University of Cincinnati*

Paul T. Heffron, PhD, *Fordham University*

Earl W. Jackson, JD, *Harvard University*

Robert C. Johnson, Jr., JD, *Cornell University*

Paul G. Keough, MPA, *Northeastern University*

Claude G. Lancome, JD, *Harvard Law School*

Fern O. Marx, PhD, *Brandeis University*

Robert H. McClain, Jr., MS, *University of Denver*

John J. McGinn, MPA, *Northeastern University*

Richard B. Morrison, EdD, *Boston University*

Elizabeth A. Mulroy, MSW, *University of Southern California*

Lawrence Onie, MPA, *University of Oklahoma*

J. Richard Poulin, MPA, *University of Oklahoma*

Carl A. Prussing, MPA, *University of New Hampshire*

Morris A. Shepard, PhD, *University of Connecticut*

Marvin M. Siflinger, MPA, *Syracuse University*

Michael L. Simmons, MPA, *Northeastern University*

Wallace E. Stickney, MPA, *Harvard University*

Marilyn Swartz-Lloyd, MCP, *Yale University*

Joseph D. Warren, PhD, *Brandeis University*

Ernest J. Zupancic, MPA, *Princeton University*

Research

The research interests of political science faculty members at Northeastern University are varied, far-reaching and draw on multiple methodologies. Recent faculty publications include an analysis of the separation of church and state controversy; an investigation that links stress and achievement patterns to mortality levels of American Presidents; an examination of China's role at the United Nations; a study of American health policy; an examination of the impact of television debates on the outcome of presidential elections and of television on the exercise of presidential power; an analysis of American policy toward Soviet intervention in Afghanistan; a study of the Kennedy Administration's civil rights record; an analysis of the Israeli police; an examination of the public bureaucracy; an exploration of Third World politics; and a study of the police and the state.

Several published research projects have used more heavily quantitative techniques, such as one that focused on the achievement patterns of women, another that explored the pro-

cess of political socialization and attitude change, and a third that studied the political affiliations of Arab students.

The published research of the faculty is complemented by its ongoing research efforts. Faculty members currently are conducting research in such diverse areas as comparative studies of women; enterprise zone strategy; the presidencies of Lincoln, Coolidge, and Franklin Roosevelt; ethnic conflict in the United States and Northern Ireland; the development and processes of the Office of Management and Budget; a cross-national analysis of the relationship between different forms of social and defense spending; the Israeli arms industry; forms of political patronage; unresolved issues in Chinese politics; the battle for women's suffrage; and the street-level police officer as a political decision maker.

Admission

Master of Arts

In addition to the admissions requirements listed on page 19, applicants for the master of arts program should have at least six semester hours of political science, government, or related courses. Test of English as a Foreign Language (TOEFL) scores are required for international applicants.

Master of Public Administration

Different procedures govern admission for those with public sector status and those with non-public sector status. Public sector status includes those working for federal, state, city, county, or town governments; military personnel and veterans (regular and reserve); and those working for nonprofit or public service organizations. All others are considered non-public sector applicants.

Public sector applicants must be employed in the public sector at the time of admission and are automatically admitted as part-time provisional students. Matriculation into the program is granted upon obtaining a B average (3.000) in the first four Public Administration courses, two of which must be core courses.

All public sector applicants must submit a completed application form, application fee, official transcripts from each college or university where undergraduate or graduate degrees or credits were earned, and a letter confirming their public sector status.

Non-public sector applicants should demonstrate a clear and strong interest in public administration. In addition to the admissions requirements listed on page 19, applicants must furnish a statement supporting their interest in this field and outlining their reasons for wishing to enter this program. Although most candidates for the MPA program come with a ma-

for concentration in the social sciences, such a background is not mandatory, and applicants from other fields, such as engineering, law, sciences, or business administration, are considered for candidacy. TOEFL scores are required for international applicants.

All applicants to political science or public administration graduate programs, including persons seeking special (non-degree) status, must follow the regular admissions procedures.

International Student Admission/English Language Assessment

In order to ensure that all international students have the English language skills necessary for graduate-level work, the Department of Political Science has a carefully devised plan of study. All international students recommended for admission initially receive a conditional status, pending English language diagnostic assessment. Conditional status indicates that the student may not be admitted to a degree candidacy until specified language requirements are met.

Diagnostic assessment is conducted by the English Language Center in conjunction with the Department of Political Science prior to registration for courses. On the basis of English language test assessment, international students are advised on an appropriate plan of study. Students who are determined as having the requisite English language skills for graduate work immediately obtain a regular student status and are admitted to graduate coursework and degree candidacy. Students whose English language assessment indicates a need for additional English language study are advised on the combination of graduate courses and English language courses needed for at least the first year of study. In cases in which international students demonstrate a pressing need for English language study, it is required that English language courses be taken prior to any graduate-level work in the Department of Political Science.

International students who have a degree from an institution abroad where the medium of instruction is English or who have an undergraduate degree from an American college or university (as stated on page 25) are exempt from the above stated language assessment.

The Master of Arts Degree

Program

Forty-two quarter hours of academic work are required. With the approval of the MA committee chairperson, a maximum of six quarter hours may be selected from graduate courses in other departments and a maximum of eight quarter hours may

be selected from advanced undergraduate courses. The undergraduate courses also require the approval of the Director of the Graduate School of Arts and Sciences.

A thesis is optional with the approval of the MA committee. If approved, a thesis carries up to nine quarter hours of credit.

Comprehensive Examination

The comprehensive examination is held in accordance with the general Graduate School regulations. Every candidate for the degree must pass examinations in two fields as prescribed by the department. Degree candidates are limited to two attempts at successful examinations in each field. Choice may be made from the following concentration areas: American government and politics, comparative government and politics, international relations, political theory, and public administration.

MA Concentrations

American Government and Politics

The field of American government and politics is concerned with developing an understanding of the structure of American political institutions as well as those political processes that result from interactions among and within institutions. Students concentrating in this field should gain an appreciation for the historical foundations of American political institutions and processes, an understanding of the normative issues revolving around the difficulties involved in making the ideals of democracy practical realities, and a thorough knowledge of basic institutions such as the presidency, Congress, and the judiciary.

Comparative Government and Politics

The comparative government graduate curriculum is intended to provide students with an opportunity to gain an understanding of the methods of comparative political inquiry and an in-depth mastery of political organization and behavior in selected geographical areas. This curriculum includes the study of theoretical and cross-national problems, contemporary political development, and institutional analyses of different types of governmental systems in different regional settings.

International Relations

The field of international relations examines the actors, issues, and actions that have impacts beyond national boundaries, in order to define these phenomena, explain the historical and present patterns of their occurrence, and illuminate the contexts in which certain patterns are likely to be experienced. Specializations within the field of international relations include issues of war and peace, U.S.-Soviet relations, and regional area studies (e.g. Middle East, Africa, Latin America, East and West Europe).

Political Theory

The field of political theory encompasses the wide span of historical and intellectual contributions delineating the nature of humans in relation to social, economic, political, and legal institutions, as well as psychological and cultural factors. Both the context in which the theories were generated and the applications and consequences of those theories are explored. Thus, the field of political theory analyzes the intellectual legacy of our Western civilization from the vantage point of both a theoretical and a practical orientation.

Public Administration

The public administration curriculum is designed to give students the opportunity to develop an understanding of what is required to function effectively as a public manager. It integrates theoretical foundations with some practical skills and seeks to promote a sense of the ethical and democratic responsibility entailed in being a public manager. It focuses attention on the academic study of public administration as a subfield of political science from the perspective of public organization and management, public finance and budgeting, public personnel administration, state and urban government, policy sciences, and development administration.

The Master of Public Administration Degree

Program

Forty-five quarter hours of academic work are required. All students must complete the following eight courses:

CPOL 3600	Survey of Public Administration
CPOL 3601	Public Personnel Administration
CPOL 3602	Organizational Theory & Management
CPOL 3603	Public Finance and Budgeting
CPOL 3604	Techniques of Policy Analysis
CPOL 3605	Quantitative Techniques for Public Administration 1
CPOL 3606	Quantitative Techniques for Public Administration 2
CPOL 3607	Quantitative Techniques 3: Computer Applications

At least five additional courses must be selected from courses designated as public administration electives. A maximum of four courses may be selected from courses in the Master of Arts program in political science or from other graduate programs at Northeastern as substitute elective courses. These courses must have the prior approval of the MPA committee chairperson.

All students beginning the MPA program who have not had a survey American government course at the undergraduate level are required to take CPOL 3502, Seminar in American Govern-

ment. Students entering the program who have not completed an undergraduate-level course in economics are required to take CECM 3111, Economics for Public Administrators.

MPA Concentrations

Students may elect to declare an MPA concentration after completing the core courses. The concentrations seek to provide integrated course offerings in key public administration fields. Each concentration area is coordinated by a full-time faculty member, who also serves as adviser to students in his/her area of concentration. There are four required courses in each concentration, as well as a variety of electives that may be selected on the basis of professional or academic interests. Concentration areas include the following:

Public Organization and Management

The public organization and management concentration area is designed for students who plan to pursue careers as practical public administrators and who want to develop a special proficiency in general managerial skills and techniques. Students are introduced to the theory and practice of management, including the areas of supervision; administration of staff activities and organization; and methods and tactics of management. The curriculum also offers the opportunity for the student to develop an understanding of the ethical, historical, political, and legal environment in which management skills have been developed and must be used.

Public Finance and Budgeting

Public finance and budgeting surveys the problems of government taxing, spending, and borrowing from a historical, political, economic, and behavioral perspective. A concentration in public finance and budgeting will offer students the opportunity to master the techniques necessary to plan and analyze public projects, formulate and execute public budgets, and audit and evaluate public programs and policies.

Public Personnel Administration

The course offerings in the public personnel administration concentration area introduce the student to the technical and skill-building aspects of public personnel administration, as well as to the theoretical issues involved in the field. This focus is well suited for those who want to make personnel administration a career, as well as for those who seek some general background in this area of public administration.

State and Urban Government

The state and urban government concentration area has been developed with three major objectives. The first is to provide

students with the opportunity to develop a rich background in the contemporary conditions, problems, challenges, and opportunities of urban government, state government, intergovernmental relations, and state and local finance and budgeting. Second, the program seeks to help make students aware of the political environment that surrounds state and urban administration. Finally, the state and urban government concentration tries to acquaint students with the techniques that are appropriate to state and urban administration.

Policy Sciences

This concentration is designed to provide students with the chance to develop the basic skills needed for policy analysis and program evaluation. It is also designed to promote the use of these skills as part of a public manager's decision-making process. Students will be offered the opportunity to learn how to apply relevant social science research methods to the analysis of public problems and how to assess the diverse consequences of governmental decisions in the broader political and economic environment.

Development Administration

The development administration concentration covers technical aspects of development administration in conjunction with area studies and provides for practical application of development administration techniques. An understanding of the political, cultural, and economic forces impinging upon the administrative programs of developing countries is also explored. This concentration will enhance the careers of students who plan to return to public service in their respective countries, as well as help students whose careers will involve work with development agencies of industrial nations or international organizations.

Off-Campus Facility

With the cooperation of the Federal Executive Board, the Department of Political Science offers its master of public administration program primarily at the John F. Kennedy Building in downtown Boston. This program is primarily for individuals employed in federal, state, or local civil services and for those who plan on a career in the public sector. Courses are normally given in the evening.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
POL 3500	Scope and Methods of Political Science	3 QH
POL 3502	Seminar in American Government	3 QH
POL 3504	Political Psychology & Socialization	3 QH
POL 3506	Politics & Mass Media	3 QH
POL 3508	Legislative Process	3 QH
POL 3510	Theories of American Political Participation	3 QH
POL 3512	American Constitutional Law 1	3 QH
POL 3514	American Constitutional Law 2	3 QH
POL 3516	The Presidency	3 QH
POL 3518	American Electoral Behavior	3 QH
POL 3519	Campaigns and Elections	3 QH
POL 3520	The Judiciary	3 QH
POL 3522	Political Parties, Pressure Groups, and Public Policy	3 QH
POL 3524	Civil Rights	3 QH
POL 3526	Procedural Due Process	3 QH
POL 3531	Models of Political Systems	3 QH
POL 3533	Eurocommunism	3 QH
POL 3535	Parliamentary Democracy in Western Europe	3 QH
POL 3537	Comparative Communism	3 QH
POL 3539	European Political Parties	3 QH
POL 3541	European Legislative Systems	3 QH
POL 3543	European National Executives	3 QH
POL 3545	Government & Politics in the Middle East	3 QH
POL 3547	Government & Politics in North Africa & the Middle East	3 QH
POL 3550	Government & Politics of the United Kingdom & Northern Ireland	3 QH
POL 3551	Seminar in International Relations	3 QH
POL 3552	International Political Economy	3 QH
POL 3553	Government & Politics in Germany	3 QH
POL 3554	Government & Politics in France	3 QH
POL 3555	International Organization	3 QH
POL 3556	China in Revolution	3 QH
POL 3557	Soviet-Chinese Relations	3 QH
POL 3558	Asia & Politics of Development	3 QH
POL 3559	Government & Politics of Latin America	3 QH
POL 3560	Development Politics	3 QH
POL 3561	Great Powers & the Middle East	3 QH
POL 3562	U.S.-Soviet Relations	3 QH
POL 3563	U.S.-Far East Relations	3 QH
POL 3564	China's Foreign Policy	3 QH
POL 3565	Soviet Relations with Eastern Europe	3 QH
POL 3566	Chinese Politics	3 QH
POL 3567	Japanese Politics	3 QH
POL 3568	Subsaharan African Politics	3 QH
POL 3569	Decision Making in U.S. Foreign Policy	3 QH
POL 3570	American Foreign Policy	3 QH
POL 3572	Problems of World Order 1	3 QH
POL 3573	Problems of World Order 2	3 QH
POL 3574	American National Security Policy	3 QH
POL 3575	Arab-Israeli Dispute	3 QH
POL 3578	Soviet Foreign Policy	3 QH
POL 3580	The United Nations	3 QH

Course No.	Course Name	Credit
POL 3581	International Peace Keeping	3 QH
POL 3583	International Law	3 QH
POL 3584	Regional Organization	3 QH
POL 3585	The Atlantic Community	3 QH
POL 3586	Nationalism	3 QH
POL 3587	Politics of Revolution & Change	3 QH
POL 3589	Terrorism, Violence & Politics	3 QH
POL 3590	Crisis Politics in Democracies and Dictatorships	3 QH
POL 3591	Totalitarianism	3 QH
POL 3593	Ancient & Medieval Political Thought	3 QH
POL 3594	Modern Political Thought	3 QH
POL 3595	Contemporary Political Theory	3 QH
POL 3596	Marxism	3 QH
POL 3597	Trends in American Political Thought	3 QH
POL 3600	Survey of Public Administration	3 QH
POL 3601	Public Personnel Administration	3 QH
POL 3602	Organizational Theory & Management	3 QH
POL 3603	Public Finance and Budgeting	3 QH
POL 3604	Techniques of Policy Analysis	3 QH
POL 3605	Quantitative Techniques for Public Administrators I	3 QH
POL 3606	Quantitative Techniques for Public Administrators II	3 QH
POL 3607	Quantitative Techniques III: Computer Applications	3 QH
POL 3610	Methods of Economic Analysis for Public Administrators	3 QH
POL 3611	Intergovernmental Relations	3 QH
POL 3613	Constitutional Law in Public Administration	3 QH
POL 3614	Administration Ethics in Public Management	3 QH
POL 3615	Development Administration	3 QH
POL 3616	State Government	3 QH
POL 3617	Industrial Policy	
POL 3618	Problems in Urban Planning	3 QH
POL 3619	Techniques of Urban Planning	3 QH
POL 3620	Politics of State & Urban Planning	3 QH
POL 3621	Problems of Urban Development	3 QH
POL 3622	Urban Government	3 QH
POL 3623	Transportation Policy	3 QH
POL 3624	Problems of Community Development	3 QH
POL 3625	Collective Bargaining in the Public Sector	3 QH
POL 3626	Grantsmanship	3 QH
POL 3627	Management Information Systems	3 QH
POL 3629	Computers & Public Administration	3 QH
POL 3630	Health-Care Administration	3 QH
POL 3631	Urban Development	3 QH
POL 3632	Public Fiscal Management	3 QH
POL 3634	Functions & Techniques of Public Management	3 QH
POL 3635	Environment & Energy Policy	3 QH
POL 3637	Comparative Public Administration	3 QH
POL 3639	Federal Administrative Law	3 QH
POL 3640	Governmental Accounting	3 QH
POL 3641	Techniques of Program Evaluation	3 QH
POL 3642	Management Planning and Decision Making	3 QH
POL 3643	Organizational Psychology & Behavior	3 QH
POL 3644	Public Policy Issues in Human Services	3 QH
POL 3645	Program Implementation	3 QH
POL 3646	Position Management	3 QH
POL 3647	Manpower Policy & Administration	3 QH
POL 3649	Regulatory Administration	3 QH
POL 3650	Group Dynamics	3 QH
POL 3652	Civil Liberties in Public Administration	3 QH
POL 3653	Survey Research for Public Administration	3 QH
POL 3654	Computer Software for Public Administrators	3 QH

Course No.	Course Name	Credit
POL 3655	Politics & Administration in Cities & Towns	3 QH
POL 3656	Business Government Relations	3 QH
POL 3657	Organizational Analysis	3 QH
POL 3658	State & Local Finance & Budgeting	3 QH
POL 3659	Municipal Finance	3 QH
POL 3660	Development Planning	3 QH
POL 3661	Municipal Law	3 QH
POL 3662	Comparative Urban Government & Administration	3 QH
POL 3663	Techniques of Public Budgeting	3 QH
POL 3664	Contemporary Issues in Public Finance and Budgeting	3 QH
POL 3665	Women in Public Management	3 QH
POL 3666	Housing Crisis	3 QH
POL 3667	Equal Opportunity in Public Administration	3 QH
POL 3668	Legal Issues in Public Personnel Administration	3 QH
POL 3669	Labor Relations in Public Administration	3 QH
POL 3670	Public Relations in Public Administration	3 QH
POL 3671	Social Welfare Policy & Administration	3 QH
POL 3673	Career Development	3 QH
POL 3674	Federal, State & Local Financing Relations	3 QH
POL 3675	Health Policy & Politics	3 QH
POL 3676	Practices in Self-Development in Public Management	3 QH
POL 3677	Elder Services Policy & Administration	3 QH
POL 3678	Federal Bureaucracy	3 QH
POL 3679	Case Studies in Development Administration	3 QH
POL 3690	Topical Seminar	3 QH
POL 3696	Politics of Public Finance & Budgeting	3 QH
POL 3697	Seminar in Public Personnel Administration	3 QH
POL 3698	Case Studies in Policy Sciences	3 QH
POL 3699	Seminar in State & Urban Administration	3 QH
POL 3884	Assigned Readings	1 QH
POL 3886	Assigned Readings	3 QH
POL 3890	Assigned Readings	6 QH
POL 3892	Internship Readings & Analysis	1-6 QH
POL 3895	Thesis	1-6 QH
POL 3798	Master's Thesis Continuation	0 QH

Psychology

The Department of Psychology has developed extensive programs of research and training in experimental psychology and in applied behavior analysis. The guiding principles are:

- Progress in the scientific analysis of behavior not only is important in its own right but also governs the application of psychology to such fields as education, habilitation, medicine, and social planning.
- Research into many of the facets of human and animal behavior requires a wide range of methods and knowledge; problems for investigation often fail to respect the boundaries between disciplines.
- The study of behavior with the methods of the natural sciences frequently demands sophisticated instrumentation for control of the environment and measurement of the behavior.
- Training in experimental psychology must be built around a series of apprenticeships in which the student collaborates with proved scholars and scientists.

In addition to developing students' research talents, the program fosters and provides opportunity for the acquisition of expertise in teaching behavioral science.

Acting Chairperson

Alexander A. Skavenski, PhD, *University of Maryland*

Professors

John C. Armington, PhD, *Brown University*

Francois Grosjean, PhD, *Doc es Lettres, University of Paris*

Harlan Lane, PhD, *Doc es Lettres, Harvard University*

Helen Mahut, PhD, *McGill University*

Joanne L. Miller, PhD, *University of Minnesota*

Bertram Scharf, PhD, *Harvard University*

Harold S. Zamansky, PhD, *Harvard University*

Associate Professors

Edward A. Arees, PhD, *University of Massachusetts*

Martin Block, PhD, *University of Pittsburgh*

Roger F. Brightbill, PhD, *Harvard University*
Perrin S. Cohen, PhD, *Columbia University*
Stephen Harkins, PhD, *University of Missouri*
Charles Karis, PhD, *Boston University*
Harry A. Mackay, PhD, *Queen's University*

Adjunct Professor

Margaret Bauman, MD, *Medical College of Pennsylvania*

Assistant Professors

John J. Carroll, PhD, *Cornell University*
Adam Reeves, PhD, *City University of New York*
Judy A. Shepard-Kegl, PhD, *Massachusetts Institute of Technology*

Senior Scientist of Psychology

Murray Sidman, PhD, *Columbia University*

Clinical Associate Professor

Karen Gould, PhD, *University of Kansas*

Adjunct Associate Professors

Beatrice H. Barrett, PhD, *Purdue University*
Robert Bass, PhD, *Brown University*
Lawrence T. Stoddard, PhD, *Columbia University*

Adjunct Assistant Professors

Renée Briggs, PhD, *Boston University*
Charles Hamad, PhD, *University of Kansas*
William L. Holcomb, MA, *Northeastern University*
Matthew L. Israel, PhD, *Harvard University*
Myrna Libby, PhD, *Brown University*

Research

Research conducted by members of the Psychology Department falls into five general areas: language (including American Sign Language) and cognition; learning, motivation, and behavior analysis; neuropsychology and biological psychology; experimental personality and social psychology; and sensation and perception. Each of these is evident among the research vignettes provided on pages 135–136. However, the list is arranged in the alphabetical order of faculty surnames to allow easy identification of a sample of the research performed by a particular faculty member. This reflects the importance to the program of the mutuality of interests that underlies the apprentice relationship between student and adviser. In addition, particular research projects often are not easily classified in broad traditional terms; their specific foci shift as they progress, and collaborations evolve. The reader should consult the brochure

Research in Psychology at Northeastern for more extensive descriptions of ongoing research.

DR. AREES—analysis of elementary responses of insects and other small organisms in relationship to structural aspects of their nervous systems. Using video recordings, the frequency and pattern of specific behaviors are analyzed and compared across different species.

DR. ARMINGTON—the relationship of psychophysics to the electrophysiology of vision. Visual-evoked potentials, electroretinograms, and eye movements are recorded in studies of pattern vision, resolution, light adaptation, and color vision.

DRS. BASS and GOULD—applied behavior analysis and mental retardation. Stimulus control techniques are applied to conceptual learning tasks and to the solution of behavior-management problems.

DR. BLOCK—biological bases of animal social behavior and communication. One ongoing experiment seeks to identify olfactory cues, and genetic and motivational factors influencing parent-infant and peer interactions of gerbils and voles.

DR. CARROLL—the interaction of linguistic and real-world knowledge in the comprehension of discourse. Current work includes analysis of factors underlying the detection and interpretation of nonliteral speech such as sarcasm and irony.

DR. COHEN—analysis of reinforcer-induced, motivated behaviors that have been described as addictive, interim, adjunctive, or schedule-induced. Current research explores the possibility that such behaviors reflect either of two types of reinforcer-induced motivational states.

DR. GROSJEAN—the psycholinguistics of monolinguals and bilinguals. Current research includes analysis of syntactic, prosodic, and lexical units in language processing.

DR. HARKINS—analysis of the social impact that the presence of others has on an individual. He is currently examining the effects of social context on persuasion.

DR. LANE—the structure, history, and use of American Sign Language to shed light on universal properties of language. One set of experiments examines how articulatory and perceptual constraints influence manual language. Another examines the relations between speech and hearing and the speech of the deaf.

DR. MACKAY—serial learning and memory and the prerequisites of conceptual learning in the retarded. In one set of studies, for

example, he uses a sequence-reproduction procedure that is analogous to the digit span test to assess effects of temporal and other variables on remembering in the retarded.

DR. MAHUT—brain mechanisms that mediate memory, with special emphasis on diencephalic and temporal lobe structures. Parallel investigations focus on immediate and long-term effects of ablations of equivalent structures in infant monkeys.

DR. MILLER—research on the production and comprehension of spoken language. Specific focus is on the acoustic-phonetic basis of language and the processes involved in phonetic perception and word recognition.

DR. REEVES—human visual perception and visual information processing. Current research concerns effects of attention and imagery on visual perception, color vision, adaptation, and visual masking.

DR. SCHARF—research in the Auditory Perception Laboratory is concerned with loudness, adaptation, masking, discrimination, and speech perception in normal and hearing-impaired persons. Experiments on auditory selective attention—the ability to listen to some sounds and ignore others—is also under study.

DR. SHEPARD-KEGL—linguistic analyses of various levels of organization in language, especially phonology and the linguistics of ASL. Ongoing work includes study of the role of locative and directional notions in language.

DR. SKAVENSKI—neural mechanisms that use visual, vestibular and eye movement information for the control of eye movement and visual space perception. Current studies aim to describe eye movements evoked by parietal cortex stimulation, natural patterns of compensatory eye movement in freely moving monkeys and fixation changes resulting from retinal lesions.

DR. STODDARD—experimental analysis of behavior occurring in an automated teaching environment for communicating with severely retarded and autistic individuals and for remediating their behavioral deficiencies. Other research involves analysis of relational discriminations in elementary forms of logical thinking, a step in explaining the emergence of novel behavior without direct conditioning.

DR. ZAMANSKY—studies of hypnosis and related phenomena. Experiments in progress deal with cognitive and motivational characteristics of hypnotizable and nonhypnotizable subjects and with the structure of suggestibility.

PhD Program

The Department of Psychology offers a full-time program of graduate studies and research in experimental psychology leading to the PhD degree. Applicants are considered only for the doctoral program—the MA is granted in the course of progress toward the PhD. Since the PhD degree is awarded in experimental psychology, accomplishment in research forms an essential and integral part of the program. Students may expect to collaborate with faculty in conducting research in one or more of the following broad areas: learning, motivation, and behavior analysis; sensation and perception; neuropsychology and psychobiology; language and cognition; and experimental personality and social psychology.

Desirable experience includes laboratory courses in psychology and allied natural sciences, as well as courses in mathematics. Applications should be filed in the department by February 15, complete with official transcripts, three letters of recommendation, and a personal essay. Scores on the Graduate Record Examination and the Miller Analogies Test should be sent to the Graduate School of Arts and Sciences office.

Research assistantships and teaching assistantships offer students the opportunity to receive a tuition scholarship. In addition, those positions also carry a stipend in return for work performed in the department. The Psychology Department endeavors to support, when possible, all graduate students requesting financial aid.

The first year of the program is uniform for all students. It includes four proseminars in advanced experimental psychology (language and cognition, neuropsychology, learning and motivation, and sensation and perception) and two courses in quantitative methods. In addition, all students are expected to choose a research adviser and take an active part in one of the current research projects. Detailed descriptions of the current research projects are contained in the brochure *Research in Psychology at Northeastern*, available on request.

At the end of the second academic year, each student's readiness for the doctoral program is determined on the basis of performance in the four proseminars and written examinations in the quantitative methods courses. Equal emphasis is placed on the quality of research.

After the first year, the structure of the doctoral program is flexible and assumes that the process of learning and scientific discovery must be individualized; however, the minimum requirements of the Graduate School of Arts and Sciences for the master's degree and the doctor of philosophy degree as established on pages 26 and 27 apply. A wide variety of advanced

seminars and courses are offered. Colloquia and in-house seminars bring students and faculty together to discuss ongoing research, often with visiting scholars from other institutions. Most important, students pursue their research projects under the guidance of their advisers. The advisers and projects available to students vary from year to year. Potential applicants are encouraged to visit the department in order to discuss their interests with the faculty and to observe the program and facilities firsthand.

MA in Applied Behavior Analysis

The Department of Psychology also offers a full-time graduate program leading to a terminal MA degree in applied behavior analysis. The program is jointly sponsored by Northeastern University and by the University-affiliated facility of the Eunice Kennedy Shriver Center for Research in Mental Retardation located at the Walter E. Fernald State School for the Retarded.

The two-year program provides the opportunity for students to prepare primarily for service-oriented clinical employment at professional and supervisory levels, in positions that relate to remedial treatment and programming for the retarded. Experience in clinical settings and in applied and laboratory research, along with the broad academic curriculum, also provides students with the opportunity to prepare for further graduate studies in human behavior and learning.

Desirable background includes academic and laboratory courses on human and animal learning, preferably with an operant-conditioning perspective, and some experience with retarded individuals. Applications should be filed by March 1, complete with transcripts, three letters of recommendation, a personal essay, and scores on the Graduate Record Examination.

Support for MA students can include full tuition remission in return for performing teaching assistant functions for the department. Also, field placements, when available, allow paid employment for a maximum of twenty hours per week.

The program is conducted primarily at the Shriver Center and associated facilities. The minimum requirements of the Graduate School of Arts and Sciences for the master's degree as established on page 26 apply. The curriculum stresses the analysis of stimulus control and programmed teaching as solutions to the problems in learning and behavior management encountered by the retarded. In addition, courses encompass the broader interdisciplinary aspects of mental retardation, covering such topics as its biological bases, neurological and sensory im-

pairments, multidisciplinary evaluation and treatment, and administration of services. Experimental design and research seminars help prepare students to conduct a number of applied projects and their master's thesis research.

Supervised clinical experience is provided with different retarded populations and age groups, including those with motor and sensory handicaps, in a variety of settings. Most students are placed in positions where they receive supervisory and administrative training. Additional experiences include interdisciplinary team evaluations using behavioral and traditional assessment methods; staff training in behavior management and training techniques; community experience via outpatient and home-treatment services, consultants to schools and clinics, and parent training; and laboratory research participation.

Most of the faculty have joint appointments in the Psychology Department of Northeastern University and in the Behavioral Sciences Department of the Shriver Center. The faculty and advisers are drawn primarily from the departmental areas of learning and personality (Gould, Mackay, Stoddard, and Zamansky) and from the staff of the Shriver Center. The MA students maintain an active involvement with the University and the parent Psychology Department through their teaching assistant functions, a number of required and elective courses, colloquia, in-house seminars, and informal exchanges with faculty and students.

Potential applicants may write for further information to the department; they are also encouraged to visit the Shriver Center and the department to discuss the program and their interests with the faculty and to see the facilities firsthand.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Schools Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
PSY 3111	Quantitative Methods I	3 QH
PSY 3113	Proseminar	4 QH
PSY 3115	Proseminar	4 QH
PSY 3116	Proseminar	4 QH
PSY 3118	Proseminar	4 QH
PSY 3119	Attention I	3 QH
PSY 3121	Experimental Design in Applied Research	3 QH
PSY 3122	Applied Programming Seminar I	3 QH
PSY 3123	Programmed Learning	3 QH
PSY 3126	Child Language Development	3 QH
PSY 3127	Neurological and Sensory Impairments Seminar I	3 QH
PSY 3128	Neurological and Sensory Impairments Seminar II	3 QH

Course No.	Course Name	Credit
PSY 3129	Mental Retardation Seminar	3 QH
PSY 3132	Behavior Intervention I	3 QH
PSY 3133	Advanced Learning Seminar I	3 QH
PSY 3143	Learning Principles and Applications I	4 QH
PSY 3145	Human Neuropsychology I	4 QH
PSY 3151	Brain and Behavior I	3 QH
PSY 3155	Sensory Psychophysiology I	4 QH
PSY 3159	Neurochemistry and Behavior	3 QH
PSY 3161	Cognition and Psycholinguistics I	3 QH
PSY 3166	Psycholinguistics	3 QH
PSY 3169	Seminar in the Structure of American Sign Language	3 QH
PSY 3171	Psychopathology I	4 QH
PSY 3185	Electrophysiological Recording	3 QH
PSY 3188	Vision I	3 QH
PSY 3189	Psychoacoustics	3 QH
PSY 3211	Quantitative Methods II	3 QH
PSY 3219	Attention II	3 QH
PSY 3222	Applied Programming Seminar II	3 QH
PSY 3225	Biological Basis of Mental Retardation	3 QH
PSY 3229	Administration of Mental Retardation Services	3 QH
PSY 3232	Behavior Intervention II	3 QH
PSY 3233	Advanced Learning Seminar II	3 QH
PSY 3243	Learning Principles and Application II	4 QH
PSY 3245	Human Neuropsychology II	4 QH
PSY 3251	Brain and Behavior II	3 QH
PSY 3255	Sensory Psychophysiology II	3 QH
PSY 3261	Cognition and Psycholinguistics II	3 QH
PSY 3264	Language Acquisition	3 QH
PSY 3269	Linguistic Theory and American Sign Language	3 QH
PSY 3271	Psychopathology II	4 QH
PSY 3288	Vision II	3 QH
PSY 3289	Perception	3 QH
PSY 3291	Research Laboratory	1 QH
PSY 3311	Quantitative Methods III	3 QH
PSY 3319	Attention III	3 QH
PSY 3321	Systematic Inquiry in Applied Research I	3 QH
PSY 3322	Applied Programming Seminar III	3 QH
PSY 3324	Behavior Change in Institutions	3 QH
PSY 3333	Advanced Learning Seminar III	3 QH
PSY 3355	Physiological and Comparative Psychology I	3 QH
PSY 3371	Social Psychology	3 QH
PSY 3388	Vision III	3 QH
PSY 3418	Modern Psychophysics	3 QH
PSY 3419	Special Topics in Psychology	*
PSY 3421	Systematic Inquiry in Applied Research II	3 QH
PSY 3422	Applied Programming Seminar IV	3 QH
PSY 3455	Physiological and Comparative Psychology II	3 QH
PSY 3477	Personality Theory and Research I	3 QH
PSY 3521	MABA Research	3 QH
PSY 3522	Applied Programming Seminar V	3 QH
PSY 3549	Practicum	3 QH
PSY 3555	Physiological and Comparative Psychology III	3 QH
PSY 3577	Personality Theory and Research II	3 QH
PSY 3649	Community Treatment	3 QH
PSY 3891	Thesis	6 QH
PSY 3894	Dissertation	0 QH
PSY 3798	Master's Thesis Continuation	0 QH
PSY 3799	Doctoral Dissertation Continuation	0 QH

*Maximum of nine quarter hours credit.

Sociology and Anthropology

The Department of Sociology and Anthropology offers a flexible program, combining sociology and anthropology and providing students an opportunity to acquire broad competence in these fields as well as in related specialized areas. Given the diverse needs of its undergraduate teaching program, the department accommodates a faculty with a wide range of substantive interests covering more than twenty-five of the areas of concentration listed in the American Sociological Association's *Guide to Graduate Departments of Sociology*. The department's offerings in anthropology are considerably more limited, concentrated mostly in social anthropology. The department has particular strengths in the following broadly defined areas:

- Cultural processes, social psychology, and social theory
- Political sociology, economic development, and social change
- Deviance, law, and social control
- Family, sex roles, and aging
- Work, occupations, professions, and organizations
- Race, ethnicity, and community studies
- Technology, population, resources, and environment

The department has no predominant paradigmatic orientation. There are on the faculty individuals who do fieldwork, as well as those who do large-scale quantitative surveys, social psychological experiments, content analysis, and comparative historical analysis. Likewise, many theoretical perspectives are represented, including critical theory, symbolic interaction, role theory, network theory, structural functionalism, structural Marxism, and world systems theory.

Professors

Morris Freilich, PhD, *Columbia University*

Elliott A. Krause, PhD, *Boston University*

Jack Levin, PhD, *Boston University*

Earl Rubington, PhD, *Yale University*

Associate Professors

Carol A. Owen, PhD, *Cornell University, Chairperson*
Arnold Arluke, PhD, *New York University*
Richard Bourne, PhD, *Harvard University, JD, Boston University*
M. Patricia Golden, PhD, *Cornell University*
Wilfred E. Holton, PhD, *Boston University*
Debra R. Kaufman, PhD, *Cornell University*
Thomas H. Koenig, PhD, *University of California, Santa Barbara*
Ronald J. McAllister, PhD, *Duke University, Graduate Coordinator*

Assistant Professors

Winifred Breines, PhD, *Brandeis University*
Paul G. Creelan, PhD, *University of Chicago*
Herman S. Gray, PhD, *University of California, Santa Cruz*
Eva Havas, PhD, *Boston University*
Maureen Kelleher, PhD, *University of Missouri, Columbia*
Alan M. Klein, PhD, *State University of New York, Buffalo*
Bruce K. MacMurray, PhD, *University of Iowa*
Judith Perrolle, PhD, *Brown University*
Michael Rustad, PhD, *Boston College*
Thomas M. Shapiro, PhD, *Washington University*
Carmen J. Sirianni, PhD, *State University of New York, Binghamton*
(on leave 1985–1986)

Research

Teaching responsibilities for a diverse undergraduate student clientele are reflected in and complemented by a remarkable level of scholarly productivity and policy involvement in a wide range of areas. In the past year, faculty members have given more than fifty papers at professional meetings and have produced more than thirty articles and chapters in books, on topics ranging from aging and athleticism to women's studies and work. In addition to recently published books on community and organization in the new left (Breines), women and achievement (Kaufman), mass murder (Levin), women in the military (Rustad), and critical studies in organization and bureaucracy (Sirianni), several other manuscripts are in press—on family violence (Bourne), community-controlled adolescents (Kelleher), contemporary debates on social problems (Rustad), and population control politics (Shapiro). Still other books are under contract and in preparation on topics including the politics of specialization in the field of rehabilitation (Arluke), gender in the social science of the 1950s (Breines), the relevance of culture (Freilich), poverty and affluence (Golden and Holton), class struggle in the legal profession (Koenig and Rustad), the death of the professions (Krause), computers and social change (Perrolle), deviance (Rubington), and equality and the division of labor (Sirianni). Faculty are also involved in research and writ-

ing on ageism (Arluke and Levin), the religious significance of behaviorism (Creelan), police discretion (Freilich), the patron system in academia (Golden), conventions that structure the print media's presentation of race riots (Gray), single-parent families (Havas), women returning to orthodox Judaism (Kaufman), the subculture of body building (Klein), political action committees (Koenig), punk counterculture (Levin), social futurism (MacMurray), theology lessons for sociology (McAllister), women in the Japanese labor market (Owen), women in science and mathematics in the United States and Japan (Owen and Golden), reproductive hazards in the work place (Perrolle, Koenig, and Rustad), environmental and equity issues in Boston (Rubin), alcoholism (Rubington), and democratization and self-management in the twentieth century (Sirianni).

Programs of Study

The Department of Sociology and Anthropology offers several degree programs: the master of arts in social anthropology, the master of arts in sociology, and the doctor of philosophy in sociology. The department also participates in the interdisciplinary doctoral program in law, policy, and society (see page 91).

Admission

The general procedures and requirements for admission to the Graduate School of Arts and Sciences are set forth on page 19. For admission to the Department of Sociology and Anthropology, all applicants must submit to the department an application form, a one- or two-page personal statement, complete official transcripts for all undergraduate and graduate studies undertaken, and three letters of recommendation (at least two of which must be academic references). Aptitude test scores (verbal, quantitative, and analytical) on the Graduate Record Examination (GRE) are also required. (In special cases, Miller Analogies Test scores may be accepted in lieu of GRE scores. Please consult the chairperson of the Committee on Graduate Studies.) Test scores should be submitted to the office of the Graduate School of Arts and Sciences. In order to advance to degree candidacy, applicants for the PhD program (see under PhD Degree, Admission) must also submit with their application written materials that demonstrate their capacity for scholarship at the doctoral level. (Copies of several course or term papers or a copy of a master's thesis or paper would be appropriate.) International students should also check page 20 of this catalog.

Applications for admission are considered on a continuing basis for entry in any term specified by the applicant, provided the application is received at least two months prior to the beginning of the term in which the student wishes to matriculate.

Students should be aware, however, that the sequencing of required courses is predicated on fall entry.

Each application is reviewed on its own merits. Any questions concerning the adequacy of the applicant's undergraduate or graduate background in sociology or anthropology are considered individually. In some cases, students may be asked to make up certain deficiencies before proceeding to the basic MA or PhD requirements. Exceptions are made with respect to procedural or substantive requirements on an individual basis if the circumstances seem sufficiently compelling.

In order to ascertain whether their interests coincide with those of the faculty, prospective candidates are urged to learn something about the scholarly interests and writings of the department's faculty and to talk with graduate students currently in residence, in addition to examining the catalog and course offerings.

Financial Aid

There are several types of financial assistance available for graduate students in the department and in the University (see page 159). The three types of assistance described below are awarded by the department. Students must apply for these awards as part of the regular application process. No separate application is required. While there can be no guarantee of financial aid, students should be aware that in recent years, the department has been able to provide either full or partial funding for most students with strong records.

Teaching Assistantships

Most of the department's teaching assistantships are awarded for thirty-nine weeks, although, dependent on undergraduate student enrollments, additional awards sometimes become available on a thirteen-week appointment basis. Teaching assistants are expected to work fifteen to twenty hours per week assisting faculty in teaching undergraduates (conducting discussion sections, grading, etc.). Assistantships provide a tuition scholarship and an additional stipend. They are generally given to continuing students, going to new students only if they have had sufficient experience in teaching undergraduates or if all other promising continuing students have been supported. During the summer quarter, only a limited number of teaching assistantships are available.

Research Assistantships

When departmental funds permit or when funds from outside sources become available, research assistantships may be awarded. Such awards are limited in number, usually to two or three per year. When available, they provide students the op-

portunity to receive a tuition scholarship. In return for an additional stipend earned with the award, students are expected to work fifteen to twenty hours per week assisting faculty in research activities. In general, research assistantships, too, are more likely to go to continuing students.

Tuition Assistantships

These awards grant tuition remission only, in return for which a student will be called upon for service (e.g., grading, proctoring, bibliographical work, or other small research tasks) of up to eight hours per week. New students are more likely to be offered tuition assistantships. Students should note that the tuition received via this type of assistantship is classified as taxable income by the Internal Revenue Service.

Although the department accepts applications for admission on a continuing basis, the application deadline for financial assistance in the following academic year is May 15. Applications received before March 15 are given priority. Decisions on financial assistance are made in the spring quarter, separate from decisions on admission. Thus, a student might hear about the admissions decision some time before hearing about the assistance decision.

As a general departmental policy, students in the MA program are limited to four quarters of full-time funding, or the equivalent. Those students who enter the PhD program with an MA or its equivalent are limited to six quarters of full-time funding, or the equivalent, by the department. (This limitation does not affect or apply to funding from other sources in the University, such as the Office of Financial Aid.) Those who enter the doctoral program directly from undergraduate school may be funded by the department for up to ten quarters. (Again, this limitation does not affect or apply to funding from other sources in the University or elsewhere.) Reappointment is contingent upon satisfactory performance in academic work and assigned duties.

Students should note the acceptance conditions and terms of appointment outlined on page 162. Students who hold assistantships are expected to devote full time to their studies and the duties of the award.

N.B.: Some of the requirements listed here for both the MA and PhD have undoubtedly been modified. Please check with the department and/or the Graduate School for the most recent information. This applies also to course offerings.



The Master's Degree

The department offers graduate programs leading to a master of arts degree in sociology or in social anthropology. Forty quarter hours of academic work, completed with a B (3.0) average or better, is required for the degree. The program usually consists of five or six required and six or seven elective courses. With the approval of the department and the Graduate School, certain advanced undergraduate courses offered by the department may be taken for graduate credit. In these courses, students must maintain better than a B (3.0) average.

Students are encouraged to fashion a program of studies best suited to their needs and abilities. To this end, all entering students should consult with the faculty adviser assigned to them. The faculty adviser not only helps the student to articulate interests and plan courses but also suggests other faculty members whose areas of interest and competence intersect with those of the student and with whom the student might consult on a regular basis. A permanent relationship with the first adviser continues only if there exists a mutual interest in such a partnership. Students may terminate or initiate an adviser/advisee relationship at any time, simply by consulting with and informing the parties concerned. The graduate secretary should also be informed of any changes.

For the master of arts in sociology, students are generally required to take two one-quarter courses in theory (usually SOC 3100 and SOC 3101) and two or three courses in methodology (usually SOC 3116 and either SOC 3117 or SOC 3120/SOC 3121, or SOA 3121/SOA 3122). The statistics requirement may be satisfied by achieving at least a B in SOC 3115 or its equivalent. All students are strongly advised to take some coursework in social anthropology. Each of the required courses carries four quarter hours of credit. Enrollment in the master's level pro-seminar (SOC 3125, SOC 3126, SOC 3127) is also suggested.

For the master of arts in social anthropology, students are generally required to take two one-quarter courses in theory (usually SOC 3100 and SOA 3100) and in methodology (usually SOA 3121 or SOC 3120 and SOA 3122 or SOC 3121), in addition to a basic course in anthropology (usually SOA 3101, SOA 3102, or SOA 3156). Other requirements are individually determined. All students are strongly advised to take some coursework in sociology. Each of the required courses carries four quarter hours of credit. Enrollment in the master's level pro-seminar (SOC 3125, SOC 3126, SOC 3127) is also suggested.

Students who can demonstrate proficiency in any of the requirements need not take those particular courses and should

petition the Committee on Graduate Studies for an opportunity to demonstrate proficiency.

With the approval of at least one faculty supervisor, a student may elect to prepare a master's paper or to revise a paper prepared for a previous course as a master's paper. The paper earns six quarter hours of credit. Students should register *once* for SOA 3810, Master's Paper in Social Anthropology, or SOC 3810, Master's Paper in Sociology, and then for SOA 3798 or SOC 3798, Master's Thesis Continuation, during each subsequent quarter that they are working on their MA paper. The continuation registrations are fee-bearing (see page 31) but not credit-bearing. It is expected that the full-time student will complete the master's paper no later than the end of the second year of study.

A student choosing this option must have substantially completed the master's paper, as certified by the faculty supervisor, on or before April 1 of the year in which the student expects to be awarded the degree. Final approval by the supervisor must be secured at least two weeks before the commencement at which the degree is to be awarded. Those who miss the April 1 deadline normally have to wait until the next academic year to receive the degree. A September degree can be arranged only if the faculty supervisor (as well as any other members, should there be a committee) is available and agrees to read the student's paper during the summer term.

The Doctor of Philosophy Degree

The department offers the PhD in sociology. Only a limited number of students are enrolled in the PhD program, so as to provide highly personalized study and research training with individual supervision.

Admission

Applicants to the doctoral program should apply for admission in the year in which they expect to complete the requirements for the master's degree. Students who possess master's degrees earned in areas other than sociology are considered for admission on an individual basis. Please note that in addition to the usual materials required for admission to the department, all applicants for the doctoral program are required to submit with their application written materials that demonstrate their capacity for scholarship at the doctoral level. (Copies of several course or term papers or a copy of a master's thesis or paper would be appropriate.) See Admission Section on page 143, as well as sections on Qualifying Examination and Degree Candidacy below.

Residence Requirement

The University's residence requirement can be satisfied by one year of full-time graduate work, or its equivalent, beyond the master of arts degree. If the student's MA degree is not in sociology, a longer period of residence is normally required. Most students should expect to spend approximately two years, or the equivalent, in full-time graduate study beyond the requirements of the master's degree.

Qualifying Examination

Students must submit written materials in the social sciences for evaluation in accordance with rules established by the Committee on Graduate Studies (COGS). These materials (copies of several course/term papers or a copy of a master's thesis/paper would be appropriate) must demonstrate the student's capacity for scholarship at the doctoral level.

All students are expected to present and discuss their work in an oral examination under guidelines established by COGS. Strengths and weaknesses evident in the written materials are discussed with the student and suggestions made for remedying any weaknesses. Students should recognize that, while diagnosis is a goal of the qualifying examination, a critical evaluation is also made. A pass/conditional or pass/no pass decision is rendered by COGS and communicated to the student in writing. Those students who receive a conditional pass must address the concerns of COGS within two months, at which time a final evaluation of pass/no pass is made and communicated to the student in writing. In light of the examination performance, the student's future course is charted with the objective of helping the department and the student to determine the best course of action. Excessive weakness would lead to a recommendation that the student consider pursuing alternatives elsewhere.

Students applying for doctoral studies from outside the department should submit their qualifying documents with their application. An oral examination is then scheduled during the first quarter of doctoral residence. Applicants without appropriate written materials in the social sciences should consult the chair of COGS. Alternative ways of completing this requirement will be considered only in exceptional circumstances and only for students with masters degrees from other universities.

The qualifying materials must be submitted and accepted before the end of the first year of doctoral residence. (Please note that for continuing students, funding beyond the MA level may be contingent on completion of this requirement before the end of the first *quarter* of doctoral residence.) Students may make only two attempts to complete this requirement. This means that students have two opportunities (not counting resubmis-

sions of conditional passes) to submit and defend acceptable qualifying documents. Should students not take and pass the examination (or should conditional passes not be resubmitted) within the time specified, or should the second attempt not prove successful, the student will be asked to leave the program.

Degree Candidacy

Degree candidacy is established in accordance with the general regulations of the Graduate School; that is, the student must have completed forty quarter hours of acceptable graduate work (the minimum course requirement of forty quarter hours constitutes the same work normally required for a master's degree) and must have passed the qualifying examination. To enter into degree candidacy in sociology, the student must also have a master of arts degree or its equivalent, three current letters of recommendation (at least two of which must be academic references) on file in the department, and an advisory committee consisting of three faculty members from the department.

Course Requirements

As prerequisites, all doctoral candidates are expected to have completed the core requirements for the master of arts in sociology (SOC 3100, SOC 3101, SOC 3115, SOC 3116, and SOC 3117—see page 147) or their equivalent. Students entering from another university or from another major may be required to take certain basic courses (e.g., the core requirements) before proceeding with the doctoral program. Credits earned for master's-level core requirements cannot be counted toward the doctorate.

Generally, thirty-three quarter hours of graduate work beyond the master's degree is required. Depending on background, experience, and performance, a greater or lesser number of formal courses may be required. Decisions on special cases are made by COGS, acting in conjunction with the student, the student's adviser(s), and the chairperson of the department.

All doctoral students are required to include in their program of study the Doctoral Proseminar (SOC 3620, SOC 3621, and SOC 3622). Also required (with a minimum grade of B) are Recent Developments in Sociological Theory (SOC 3301) and Current Issues in Social Research (SOC 3321). All doctoral candidates are strongly urged to take additional research courses, especially Multiple Regression (SOC 3320) and, if they have not taken it previously, the Qualitative Methods sequence (SOC 3120/SOC 3121 or SOA 3121/SOA 3122).

Students who can demonstrate proficiency in any of the requirements need not take those particular courses and should petition COGS for an opportunity to demonstrate proficiency.

Students should register for SOC 3820, Doctoral Dissertation for three terms and then for SOC 3799, Doctoral Dissertation Continuation, during each subsequent quarter that they are working on their dissertation. These registrations are fee-bearing (see page 29) but not credit-bearing.

Language Requirement

The language requirement may be satisfied by a reading knowledge of one language other than English in which there is substantial sociological literature or by a language needed for research in the student's area of specialization. Students must submit their choice of language to COGS for approval. The committee arranges for a means of demonstrating language competency. A research language may be a computer language or the native language of a foreign student, if these languages can be shown to be relevant to the student's dissertation research interests. The language requirement should be satisfied before students attempt to fulfill the comprehensive requirement (see below).

Teaching Requirement

All doctoral candidates are required to teach. Students should register for SOC 3615, Tutorial in Teaching (for which a maximum of three quarter hours of credit may be counted toward the degree) during a term in which they are responsible for teaching a course. The COGS approves the tutorial credit, taking into consideration materials and evaluations supplied by the student.

Research Experience

All doctoral candidates are encouraged to acquire practical experience in social science research. This requirement may be met through working as a research assistant, through a directed study, or through some other arrangement acceptable to the candidate and COGS.

Comprehensive Requirement

During the period of doctoral degree candidacy, each student must complete the comprehensive requirement, the purpose of which is to ensure that the student has mastery in two substantive areas of sociology. To demonstrate mastery, the student must prepare two area portfolios, each area portfolio to be assembled under the supervision of a review committee consist-

ing of three faculty members designated by the student and approved by COGS. The area portfolio, which would consist of any combination of written work (papers, examinations, or other assignments) deemed to be acceptable by the review committee, must include an annotated bibliography and a discussion of general issues in the area. A formal written examination might reasonably constitute one element of the portfolio, but such an examination would not be included unless the student petitioned for its inclusion and the review committee concurred. All students are expected to present their work in an oral defense of one hour for each portfolio, or two hours if the portfolios are presented jointly.

The portfolio is initially evaluated by the review committee on a pass/conditional pass/no pass basis. Portfolios given a conditional pass must be rewritten or redone within two months to address the review committee's concerns and must be resubmitted for a final evaluation of pass/no pass.

Students may make only two attempts to complete a particular portfolio. In other words, students have two opportunities (not counting resubmissions) to prepare an acceptable portfolio in each of their substantive areas. Should either of the portfolios not be accepted after a second submission (except under extraordinary circumstances), the student will be asked to leave the program. Likewise, should both of the portfolios receive a no pass evaluation on first submission, the student's candidacy will be terminated.

The comprehensive requirement must be completed at least nine months before the commencement at which the PhD is to be awarded. Until September 1985, students who entered the department before September 1983 may complete the comprehensive requirement in accordance with the guidelines outlined in either the 1980-82, 1982-84, or 1984-85 *Graduate School of Arts and Sciences Catalog*. Students who entered the department between September 1983 and September 1984 are required to adhere to the guidelines outlined in the 1982-84 or 1984-85 catalog. From September 1985, all students must adhere to the guidelines in the 1984-85, or succeeding, catalog.

Dissertation Proposal Hearing

The student must submit a prospectus describing the topic of the doctoral dissertation, the methods of research, and the theoretical relevance of the problem. This prospectus is to be discussed with, and approved by, the dissertation committee consisting of the student's major adviser, two readers within the department, and at least one reader from outside the department. A formal hearing is scheduled, at which the student

assembles the committee and other interested faculty and students to discuss the proposed work critically. If refinement of the proposal is considered necessary, the student is required to modify the document to satisfy the committee. The revised prospectus is then filed with the department. There is no alternative to the proposal hearing.

**Deadlines for
Considering a
Doctoral Dissertation**

The chairperson of the dissertation committee should be fully satisfied that a dissertation is substantially complete on or before April 1 of the year in which the candidate expects to defend the dissertation. A defense that might enable the student to receive a September degree can be arranged only if all members of the student's committee are available and agree to arrange a defense during the summer term.

**Final Oral
Examination**

The dissertation may be defended only after completion of all other requirements for the doctoral degree. This oral defense is held approximately four weeks after the dissertation has been accepted by the dissertation committee, and at least two weeks before the commencement at which the degree is to be awarded. Please note that candidates for the doctoral degree must be registered for Doctoral Dissertation (SOC 3820 or SOC 3799) during the term in which the dissertation is defended at the final oral examination.

N.B.: Some of the requirements listed here for both the MA and PhD have undoubtedly been modified. Please check with the department and/or the Graduate School for the most recent information. This applies also to course offerings.

Course Listings

The following is a listing of all departmental course offerings. Please refer to the *Graduate Course Descriptions* for course descriptions and relevant prerequisites.

Course No.	Course Name	Credit
SOA 3100	Theory	4 QH
SOA 3101	Human Origins	4 QH

Course No.	Course Name	Credit
SOA 3102	Evolution of Society	4 QH
SOA 3120	Visual Anthropology	3 QH
SOA 3121	Fieldwork 1	4 QH
SOA 3122	Fieldwork 2	4 QH
SOA 3135	Language and Communication	3 QH
SOA 3145	Peasant Society	3 QH
SOA 3155	Individual and Culture	3 QH
SOA 3156	Family in Evolutionary Perspective	4 QH
SOA 3185	Aggression	3 QH
SOA 3220	Culture and Mental Illness	3 QH
SOA 3265	Anthropology of Religion	3 QH
SOA 3275	Anthropology of Music	3 QH
SOA 3300	Cultural Ecology	3 QH
SOA 3310	Social Change and Economic Development	3 QH
SOA 3311	Social and Cultural Change	3 QH
SOA 3345	Urban Ethnography	3 QH
SOA 3355	Anthropology of Law and Conflict	3 QH
SOA 3360	Economic Anthropology	3 QH
SOA 3410	Contemporary Issues in Social Anthropology	3 QH
SOA 3411	Contemporary Issues in Social Anthropology	3 QH
SOA 3412	Contemporary Issues in Social Anthropology	3 QH
SOA 3413	Contemporary Issues in Social Anthropology	3 QH
SOA 3420	Kinship and Social Structure	3 QH
SOA 3425	Tribal Societies and Culture	3 QH
SOA 3440	Ethnographic Area Courses	3 QH
SOA 3441	Ethnographic Area Courses	3 QH
SOA 3442	Ethnographic Area Courses	3 QH
SOA 3443	Ethnographic Area Courses	3 QH
SOA 3444	Ethnographic Area Courses	3 QH
SOA 3445	Indian Culture	3 QH
SOA 3600	Seminar	3 QH
SOA 3601	Seminar	3 QH
SOA 3602	Seminar	3 QH
SOA 3800	Directed Study	3 QH
SOA 3801	Directed Study	3 QH
SOA 3802	Directed Study	3 QH
SOA 3810	Master's Paper in Social Anthropology	6 QH
SOA 3798	Master's Thesis Continuation	0 QH
SOC 3100	Foundations of Social Theory I	4 QH
SOC 3101	Foundations of Social Theory II	4 QH
SOC 3103	American Society	3 QH
SOC 3115	Introduction to Statistical Analysis in Sociology	4 QH
SOC 3116	Introduction to Research Methods	4 QH
SOC 3117	Quantitative Research Methods	4 QH
SOC 3120	Seminar in Qualitative Analysis I	4 QH
SOC 3121	Seminar in Qualitative Analysis II	4 QH
SOC 3125	Proseminar I	1 QH
SOC 3126	Proseminar II	1 QH
SOC 3127	Proseminar III	1 QH
SOC 3135	Issues in Social Psychology	3 QH
SOC 3140	Sociology of Prejudice and Discrimination	3 QH
SOC 3147	Urban Sociology	3 QH
SOC 3148	Boston Seminar	3 QH
SOC 3149	Metropolitan and Regional Issues	3 QH
SOC 3155	The Family	3 QH
SOC 3160	Women, Men and Social Change	3 QH
SOC 3165	Sociology of Education	3 QH
SOC 3166	Sociology and Anthropology in the Schools	4 QH

Course No.	Course Name	Credit
SOC 3170	Intergroup Relations	3 QH
SOC 3171	Race and Ethnic Relations: A World Perspective	3 QH
SOC 3175	Sociology of Work	3 QH
SOC 3176	Sociology of Occupations and Professions	3 QH
SOC 3185	Sociology of Deviant Behavior	3 QH
SOC 3186	Social Control I	3 QH
SOC 3187	Social Control II	3 QH
SOC 3190	Sociology of Delinquency	3 QH
SOC 3200	Sociology of Alcoholism	3 QH
SOC 3205	Sociology of Crime and Justice	3 QH
SOC 3206	Sociology of Law	3 QH
SOC 3215	Sociology of Medicine	3 QH
SOC 3225	Sociology of Aging	3 QH
SOC 3226	Processes of Aging	3 QH
SOC 3240	Formal Organizations	3 QH
SOC 3245	Sociology of Poverty	3 QH
SOC 3275	Sociology of Art	3 QH
SOC 3276	Popular Culture	3 QH
SOC 3286	Sociology of Science	3 QH
SOC 3300	Contemporary Sociological Theories	3 QH
SOC 3301	Recent Developments in Sociological Theory	3 QH
SOC 3302	Sociology of Knowledge	3 QH
SOC 3303	Economic Sociology	3 QH
SOC 3304	Feminist Theory	3 QH
SOC 3310	Social and Cultural Change	3 QH
SOC 3320	Multiple Regression in Sociological Analysis	3 QH
SOC 3321	Current Issues in Social Research	3 QH
SOC 3322	Experimental Methods I	3 QH
SOC 3323	Experimental Methods II	3 QH
SOC 3325	Sociology of Policy, Planning, and Evaluation	3 QH
SOC 3335	Seminar in Symbolic Interaction	3 QH
SOC 3336	Seminar on Socialization I	3 QH
SOC 3337	Seminar on Socialization II	3 QH
SOC 3338	Seminar on Socialization III	3 QH
SOC 3345	Community Analysis	3 QH
SOC 3347	Seminar in Urban Sociological Policies	3 QH
SOC 3355	Political Sociology	3 QH
SOC 3357	Comparative Socialism	3 QH
SOC 3360	Social Stratification	3 QH
SOC 3365	Social Movements	3 QH
SOC 3390	Seminar in Social Structure I	3 QH
SOC 3391	Seminar in Social Structure II	3 QH
SOC 3405	Theories of Criminology	3 QH
SOC 3410	Contemporary Issues in Sociology	3 QH
SOC 3411	Contemporary Issues in Sociology	3 QH
SOC 3412	Contemporary Issues in Sociology	3 QH
SOC 3413	Contemporary Issues in Sociology	3 QH
SOC 3430	Latin American Societies	3 QH
SOC 3431	Middle East Area Study	3 QH
SOC 3470	Sociology of Religion	3 QH
SOC 3485	Computers and Society	3 QH
SOC 3600	Seminar	3 QH
SOC 3601	Seminar	3 QH
SOC 3602	Seminar	3 QH
SOC 3603	Rhetoric in Sociology	3 QH
SOC 3615	Tutorial in Teaching	3 QH *

*Maximum of three quarter hours credit.

Course No.	Course Name	Credit
SOC 3620	Doctoral Proseminar I	1 QH
SOC 3621	Doctoral Proseminar II	1 QH
SOC 3622	Doctoral Proseminar III	1 QH
SOC 3800	Directed Study in Sociology	3 QH
SOC 3801	Directed Study in Sociology	3 QH
SOC 3802	Directed Study in Sociology	3 QH
SOC 3810	Master's Paper in Sociology	6 QH
SOC 3820	Doctoral Dissertation	0 QH
SOC 3798	Master's Thesis Continuation	0 QH
SOC 3799	Doctoral Dissertation Continuation	0 QH



General Information

Financial Information

Financial Obligations

Tuition and Fees

Tuition rates and all fees are subject to revision by the President and the Board of Trustees at any time and may change annually. Current tuition rates and fees are listed in the brochure *Graduate School Expenses*, which may be obtained from the Bursar's Office or the Graduate School office.

Tuition statements are mailed to students by the Bursar's Office and are payable by cash or check to Northeastern University on or before the date specified.

Refunds

Tuition refunds will be granted only on the basis of the date appearing on the official withdrawal form filed by the student. Nonattendance does not constitute official withdrawal. Questions regarding refunds should be discussed with the Bursar's Office.

Refunds will be granted in accordance with the following schedule:

<i>Official Withdrawal Filed Within:</i>	<i>Percentage of Tuition Refunded</i>
First week of quarter	100
Second week of quarter	75
Third week of quarter	50
Fourth week of quarter	25

Financial Assistance

Northeastern University offers graduate students a variety of means for obtaining financial assistance. In addition to various types of assistantships awarded by the individual graduate schools, the Office of Financial Aid administers several forms of financial aid. A limited number of fellowships are also available to minority students through the African-American Institute, and each year there are part-time residence hall staff positions available.

Office of Financial Aid

The Office of Financial Aid offers several types of assistance to graduate students. All awards are based on financial need. Since the majority of these awards are sponsored by the federal government, the amount of aid granted is dependent upon the amount of funds allocated to Northeastern University each year.

In order to meet application deadlines for financial aid, students may have to apply for aid before they have been offered admission to the Graduate School. However, only those students who are accepted will be reviewed for financial aid. In addition, the University only awards financial aid to students who are U.S. citizens and permanent residents of the United States. Students who are studying in the United States on student visas are not eligible for federal assistance.

Northeastern University is a participant in the Graduate and Professional School Financial Aid Service (GAPSFAS). All applicants for financial aid must file a GAPSFAS form in order to be considered.

All sections of the GAPSFAS form, including the parents' section, must be completed and sent to GAPSFAS, Box 2614, Princeton, New Jersey 08540. In addition to the GAPSFAS form, Northeastern also requires a Graduate School Financial Aid Application and a Financial Aid Transcript. All of these forms are available at the Office of Financial Aid, 254 Richards Hall.

National Direct Student Loan

This program is available to full-time graduate students who show a high level of financial need. Graduate students may borrow up to \$12,000 during the course of their entire educational careers. Repayment and interest do not begin until six months after the student ceases to carry at least a half-time academic load. Repayment may be extended over a ten-year period with an interest rate of five percent per annum. No payments are required for up to three years while a borrower is serving in the Armed Forces, Peace Corps or VISTA or is working as a full-time volunteer for a tax-exempt charitable organization.

College Work-Study Program

This program is available to full-time graduate students who show financial need. It is designed to give students an opportunity to earn as much as \$5.75 per hour working in jobs on or off campus in public or private nonprofit organizations. This program is administered solely by the Office of Financial Aid and should not be confused with the University's Cooperative Education Program.

Guaranteed Student Loan Program

Under this program, students whose families have adjusted gross incomes under \$30,000 may borrow money for educational expenses from banks or other private lending institutions. Students whose families have adjusted gross incomes that exceed \$30,000 may also borrow if they can show financial need in accordance with guidelines established by the U.S. Department of Education. Students must be enrolled on at least a half-time basis to be eligible for these loans. Terms and conditions of these loans vary from state to state. Repayment, which begins six months after the student ceases to carry at least a half-time load, may be extended for as long as ten years. The interest rate during repayment is nine percent per annum. No payments are required for up to three years while the borrower is serving in the Armed Forces, Peace Corps, or VISTA or is working as a full-time volunteer for a tax-exempt charitable organization. Information and applications are available from lenders, state guarantee agencies, and regional offices of the U.S. Department of Education. Massachusetts residents may contact the Office of Financial Aid for more information.

N.B.: This information is current as of the date of this publication. All federal programs are subject to change. Please check with the Office of Financial Aid to determine the status of financial aid programs at the time you plan to enroll.

Scholarships

Northeastern University Minority Fellowships

These fellowships are to assist a limited number of students accepted for full-time study in the graduate schools of the University. The awards, which offer a monetary grant and remission of tuition, are made to students who demonstrate superior academic achievement and are competitive within their graduate school. Applications may be obtained from the Graduate School office.

Martin Luther King, Jr., Scholarship

A limited number of full-time Martin Luther King, Jr., Scholarships are available. These scholarships pay the recipient's full tuition and fees during the course of satisfactory graduate work. Further information and applications are available at the African-American Institute, Northeastern University, 40 Leon Street, Boston, Massachusetts 02115.

Assistantships

Northeastern University has available a limited number of assistantships for full-time students who are working toward their master's or doctoral degree. Candidacy for these awards may be established by completing the appropriate application obtained in the Graduate School office. Those students already enrolled should consult their advisers.

Appointments to assistantships are ordinarily announced no later than April 15 for the following academic year or summer. Appointments are for a maximum of three quarters and are not automatically renewed. Students who hold assistantships are expected to devote full time to their studies and the duties of the award. Exceptions to this latter policy must be petitioned through the departments to the Graduate School Office. In addition, students are required to maintain full-time registration status in all quarters in which an assistantship is held. For the definition of full-time status, see page 22.

Failure to meet stated academic and job-related requirements may result in the termination of an assistantship.

Teaching Assistantships

A limited number of teaching assistantships are available to graduate students, offering them the opportunity to receive a tuition scholarship. A stipend is also given with the award in return for academic assistance in the department in areas directly related to the teaching function. Holders of such awards are expected to devote half their time to the duties of the award and the balance to coursework.

Graduate Administrative Assistantships

Some departments offer graduate administrative assistantships, which provide students the opportunity to receive a tuition scholarship. A stipend is also given with the award in return for half their time spent in assisting the department with non-teaching, administrative duties. These assistantships are available on a limited basis.

Research Assistantships

Several departments offer a limited number of research assistantships, giving students an opportunity to receive a tuition scholarship. A stipend is also given in return for research done in the department. Certain of these grants require half-time work on research in the department, with the remaining time devoted to coursework. Others provide for full-time work on research used for a thesis or dissertation.

Northeastern University Tuition Assistantships (NUTA)

A limited number of tuition assistantships are available, offering remission of tuition to full-time students assisting ten hours a week in the administrative work of the department. These awards are normally given to students in the first year of graduate work. Students should note that the value of the tuition received via this type of assistantship has been defined by the Internal Revenue Service as taxable. Applications may be obtained from the Graduate School office.

**Acceptance
Conditions**

Northeastern University, which is a member of the Council of Graduate Schools of the United States, subscribes to the following resolution of the Council:

Acceptance of an offer of financial aid (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by an actual or prospective graduate student completes an agreement which both student and graduate school expect to honor. In those instances in which the student accepts the offer before April 15 and subsequently desires to withdraw, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer.

**Residence Hall Staff
Positions**

A limited number of residence staff positions in housing facilities are available each year. Appointments carry a minimum compensation of room and board. Further information may be obtained from the Office of University Housing, 104–106 Ell Building.

Outside Grants

Frequently, the Dean's Office receives announcements of available funds for research sponsored by organizations outside the University, such as the National Science Foundation and the National Endowment for the Humanities. For further information contact the Dean's Office, 400 Meserve Hall, 437-3980.

The federal aid programs listed above are available to citizens and permanent residents of the United States. All financial aid is available on a limited basis.

Facilities and Resources

In 1910, Northeastern University began new construction on the first piece of land acquired at its present Huntington Avenue site. Since those early days, the central Boston campus has grown to occupy over fifty acres of land located near to such cultural landmarks as Symphony Hall, the Museum of Fine Arts, the Isabella Stewart Gardner Museum, Horticultural Hall, and the Boston Public Library, among others. The University is within walking distance of Fenway Park, Copley Place, the Back Bay shopping district, and a number of renowned hospitals, including Brigham and Women's and other Harvard teaching hospitals.

In addition to five suburban campuses and branch locations and several off-campus athletic facilities, Northeastern University maintains a variety of affiliations that provide its students access to facilities and specialized equipment at other institutions or from other organizations.

The Boston Campus

The central Boston Campus is built around a quadrangle, one side of which faces Huntington Avenue, a major artery dividing the campus. The buildings surrounding the quadrangle characterize the urban design of the campus, and the innovative design of new buildings added in recent years has maintained an architectural theme that is both attractive and functional.

The campus itself has been planned to provide easy access to classrooms, laboratories, and administrative offices through a series of connected walkways and a network of underground corridors, providing routes that are especially convenient during periods of inclement weather. As the University continues to expand, parking and recreational areas are integrated into the campus along with new academic facilities.

Suburban Facilities

Northeastern University's five suburban campuses provide administrative and classroom facilities for the University's graduate, adult, and continuing education programs as well as the environment necessary for specific programs of study that could not be accommodated in an urban area.

The Warren Center provides a practical laboratory in outdoor education and conservation and in camping administration, programming, and counseling. It also offers a summer campsite for various community and University groups and activities and is available as a conference and workshop site.

The Marine Science and Maritime Studies Center is located in Nahant, on Massachusetts Bay, twenty miles northeast of Boston, and serves as a site for national and international as well as University research.

Henderson House is Northeastern University's conference center. Located twelve miles from Boston in suburban Weston, Henderson House hosts a variety of round-the-clock activities, including residential seminars, workshops, short courses, and weekend meetings.

The Suburban Campus of Northeastern University is located in Burlington, near the junction of routes 128 and 3. Graduate courses in engineering, business administration, and education as well as undergraduate courses for part-time students are offered here. The Burlington Campus also offers special programs for adults and noncredit continuing education courses.

The Suburban Campus is situated close at hand to another Northeastern University facility, the Botanical Research Station in Woburn, which contains a small arboretum and a spacious greenhouse used for propagation and research.

One of the most recent campus acquisitions is the twenty-acre Dedham Campus, just north of Route 128. This recently renovated facility provides space for the College of Business Administration's new High Technology MBA program and offices for the Center for Continuing Education.

University Libraries

The University Libraries include seven units. On the Boston campus, there is the main facility Dodge, and three libraries that house graduate-level collections: Chemical and Biomedical Sciences, Mathematics/Psychology, and Physics/Electrical Engineering. There are also three libraries located on the Burlington and Dedham campuses and at the Marine Science and Maritime Studies Center in Nahant.

The total holdings of the University Libraries include the equivalent of more than one million volumes in print and in microform, 5000 periodical titles, 300,000 government documents, and 24,000 items in audio-visual and computer software formats.

In the main library, the Learning Resources Center provides computer-assisted-instruction, microcomputer facilities, and language and music listening laboratories. Also housed in the Center is an extensive set of self-paced media materials, in

varied interactive formats, including audiotapes, videotapes, and computer-assisted lessons and exercises.

The University's membership in the Boston Library Consortium generally allows Northeastern University students on-site use of consortium libraries at the following institutions: Boston College, Boston Public Library, Boston University, Brandeis University, MIT, State Library of Massachusetts, Tufts University, the University of Massachusetts (Amherst, Boston, and Worcester campuses), and Wellesley College. Borrowing privileges may also be granted to graduate students who hold a consortium card.

Academic Computer Services

Academic Computer Services supports research activities of faculty, research personnel, and graduate students, as well as teaching and learning activities, at both the graduate and undergraduate levels. The computational capability of this facility includes 115 IBM personal computers linked in local area networks at the Boston, Burlington and Dedham campuses. A wide area network also provides both students and faculty with time-sharing access to five large computers through video and hard-copy terminals arranged in clusters at all three campuses. The wide area network connects three Digital Equipment Corporation VAX-11/780 systems in Richards Hall plus an additional VAX 11/785 and a Data General MV/8000 in the Engineering Computer Center. This network also provides access through a number of dial-in telephone lines, primarily for faculty use, to all five computers. A variety of graphics and output devices are also available. Effective utilization of all facilities is promoted by availability of programming assistance at all three campuses.

Electronic spreadsheet and word processing packages are available, as well as numerous software libraries for numerical, statistical, and financial applications. The primary languages supported for those who choose to do their own programming are FORTRAN, COBOL, BASIC, PASCAL, LISP, PL/1, and Assembler.

Graduate Student Housing

Full-time graduate students enrolled in a graduate program may reside in a University apartment facility. Assignments are made on a first-come, first-served basis after an application and deposit are received. There are no accommodations for married students in University housing. The University also maintains listings of off-campus rooms and apartments.

Department of Career Development and Placement

The Department of Career Development and Placement offers a wide range of counseling and placement services to all seniors, graduate students, and alumni of Northeastern University seeking employment, as well as to students interested in participat-

ing in nonpaid, part-time internships in private or public nonprofit agencies, for which they may receive academic credit.

Through this department, representatives of hundreds of employers are scheduled to visit the campus each year to interview seniors and graduate students for full-time employment after graduation. A job bank of currently available positions is maintained for alumni who are seeking new opportunities for which they may be qualified. Credential service is provided for students and alumni seeking positions in the field of education and for applicants to graduate and professional schools. Regularly scheduled seminars are conducted for seniors, graduate students, and alumni on career development, job-finding techniques, resume preparation, and effective interviewing. Individual career counseling is available for seniors, graduate students, and alumni of all University programs.

Sports, Dance, and Exercise Facilities

Through its Cabot Center for Physical Education, Dockser Hall, and Barletta Natatorium, Northeastern University offers a wide variety of specialized facilities, including basketball courts, a dance studio, an indoor athletic field and running track, a gymnastics room, a combative sports room, weight-training rooms, a swimming pool, a crew practice tank, handball courts, and motor performance and exercise physiology laboratories. The Matthews Arena, with seating for more than 5,000 fans, provides home ice to the University's varsity and subvarsity hockey teams and, when the portable playing floor is down on the ice, home court to the University's basketball teams.

For organized athletic activities requiring facilities not available on the main campus, Northeastern maintains several off-campus locations, including the Northeastern Boat House, which is located on Memorial Drive in Cambridge and provides a home for the University's crew teams. The Edward S. Parsons Field, on Kent Street in Brookline, is the playing ground for the football, baseball, women's lacrosse and women's field hockey teams and some intramurals.

Ell Student Center

The Carl S. Ell Student Center provides facilities for student recreation and extracurricular activities. The Alumni Auditorium, with a seating capacity of 1,300, is part of the center. Also included are special drama facilities, a ballroom, a main lounge, a fine arts exhibition area, student offices, conference rooms, a cafeteria with seating for more than 1,000, and the bookstore.

Lane Health Center

A comprehensive program of medical care is provided to all full-time graduate and undergraduate students. The University maintains a Health Services Clinic, which is open for emergencies at all times and is equipped to deal promptly with any

medical condition that may arise. All entering full-time students must submit a pre-entrance physical examination form provided by the Lane Health Center prior to registration. Failure to fulfill this requirement can delay registration and result in a penalty fee and an additional fee for a physical examination.

Counseling and Testing Center

Counseling and testing to aid a student or prospective student with career, educational, or personal concerns are available days and certain weekday evenings until 8:30 p.m. Information and appointments may be obtained by calling 617-437-2142 or by visiting the Counseling and Testing Center.

Office of Services for the Handicapped

Any student who has a disability-related special need, no matter how minor or individual, can receive ready support services from the Office of Services for the Handicapped (OSH). Frequently, students are uncertain about how they may be aided by this office, and in these situations a discussion of possible alternatives can be quite helpful. OSH provides a wide range of support services to eliminate the competitive disadvantages that a disability may create. Services are individually tailored to meet the needs of each student.

The types of assistance available from OSH include orientation, help with registration and preregistration, operating as an information clearinghouse, counseling, assistance in finding housing, and services for the visually impaired, hearing-impaired, and wheelchair-using or mobility-impaired student.

OSH is also the gathering place for the Disabled Student Organization of Northeastern University, which works cooperatively with OSH to plan programs and improve accessibility of services for handicapped persons at Northeastern.

Office of Multicultural Student Affairs

The Office of Multicultural Student Affairs was created for the purpose of meeting the needs of Third World students. The office oversees the coordination and implementation of support services provided by the English Language Center, the and International Student Office. Moreover, the Office of Multicultural Student Affairs provides advocacy representation at the upper level of University administration, thereby ensuring that the needs of Third World students are being comprehensively addressed.

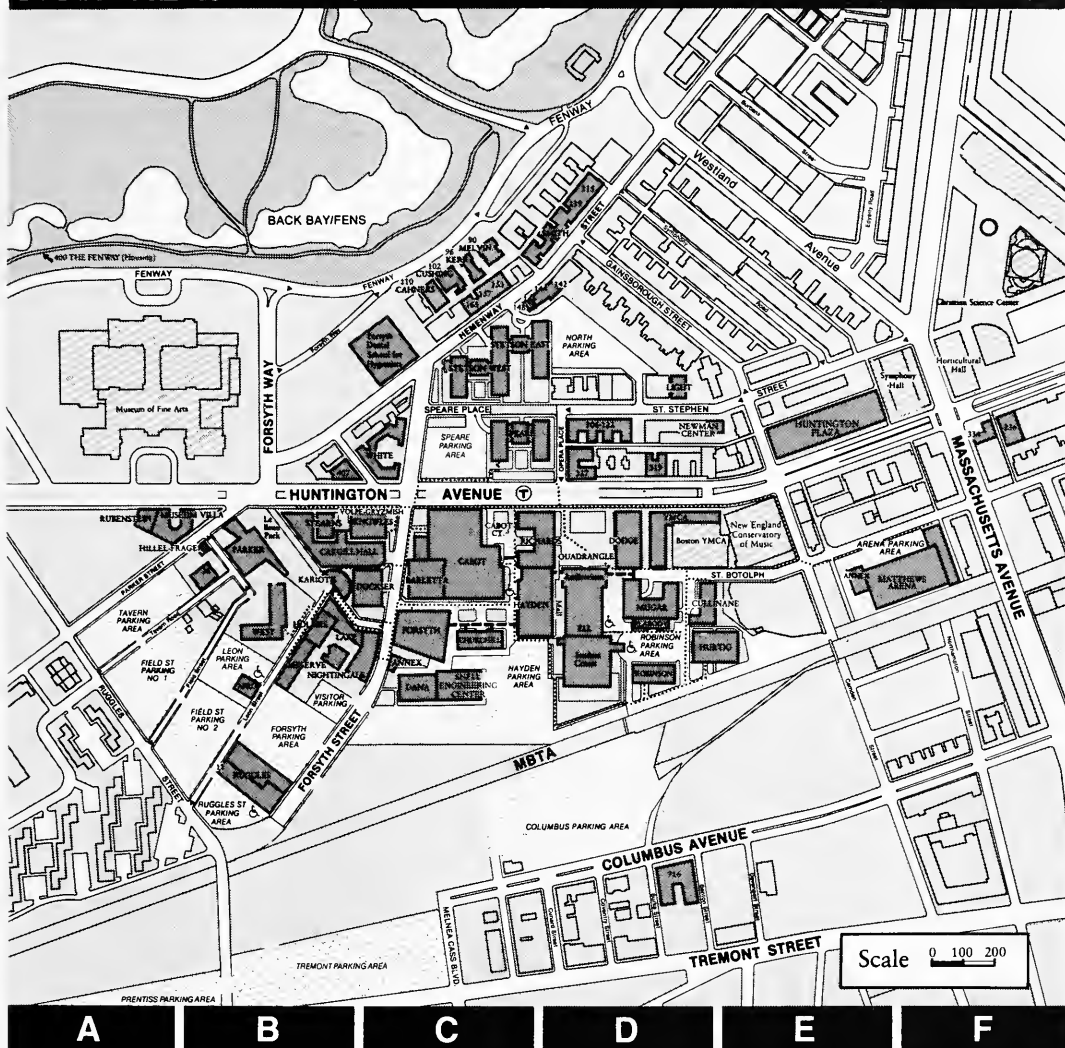
Network Northeastern (NNU)

Network Northeastern (NNU) represents the University's entry into the age of education by telecommunications. The network's main mode of operation utilizes the microwave-based Instructional Television Fixed Service (ITFS) system, by means of which educational services are delivered directly to company

sites and other remote locations within a thirty-mile radius of Northeastern's Boston Campus. With this service, live classroom instruction is telecast in color to remote sites, where it is viewed in reception rooms equipped with television monitors and a telephone-based talk-back system. During the presentation, the off-campus students are able to participate as fully in the instruction as can students sitting in the originating classroom on campus. A courier service is provided to collect and deliver homework assignments and to serve as the off-campus students' link to the bookstore, Registrar, and other campus services.

Network Northeastern currently offers courses in graduate engineering, undergraduate engineering technology and selected arts and sciences topics. This instruction is telecast daily between 8:00 a.m. and 10:00 p.m. on four channels to off-campus students at fifteen company sites and two suburban campuses.





Academic and Service Buildings

B	African-American Institute (AF)
C	Barklett Natatorium (BN)
DE	Boston YMCA (BY)
C	Cabot Physical Education Building (CB)
C	Cahners Hall (CA)
B	Cargill Hall (CG)
C	Churchill Hall (CH)
D	716 Columbus Avenue
DE	Cullinane Hall (Botolph) (CN)
C	Cushing Hall (CU)
C	Dana Research Center (DA)
B	Dockser Hall (DK)
D	Dodge Library (DG)
D	Ell Student Building (Auditorium) (EL)
D	Ell Student Center (Student Lounge) (EC)
C	Forsyth Building (FR)
C	Forsyth Building Annex (FA)
C	Hayden Hall (HA)
A	Hillel-Frager
B	Holmes Hall (HO)
F	236 Huntington Avenue
E	271 Huntington Plaza (HN)
DE	Hurtig Hall (HT)

B	Kariotis Hall (KA)
C	Kerr Hall (Faculty Center)
B	Knowles Center (Gryzmish Hall) (KG)
B	Knowles Center (Volpe Hall) (KV)
B	Lake Hall (LA)
F	334 Massachusetts Avenue
F	Matthews Arena (MA)
EF	Matthews Arena Annex (ARENX)
B	Meserve Hall (ME)
D	Mugar Life Science Building
D	(Peabody Health Professions Center) (MU)
DE	Newman Center
B	Nightingale Hall (NI)
B	Parker Building (PA)
D	Peabody Center
C	Richards Hall (RI)
D	Robinson Hall (RB)
AB	Ruggles (11 Leon Street) (UO)
C	Snell Engineering Center (SN)
D	122 St. Stephen Street
B	Stearns Center (ST)
A	26 Tavern Road (TA)

Key

Academic, Residential,
and Service Buildings

Handicapped Parking

Handicapped Routes

Parking Areas

Public Buildings

Public Parks

Street Direction

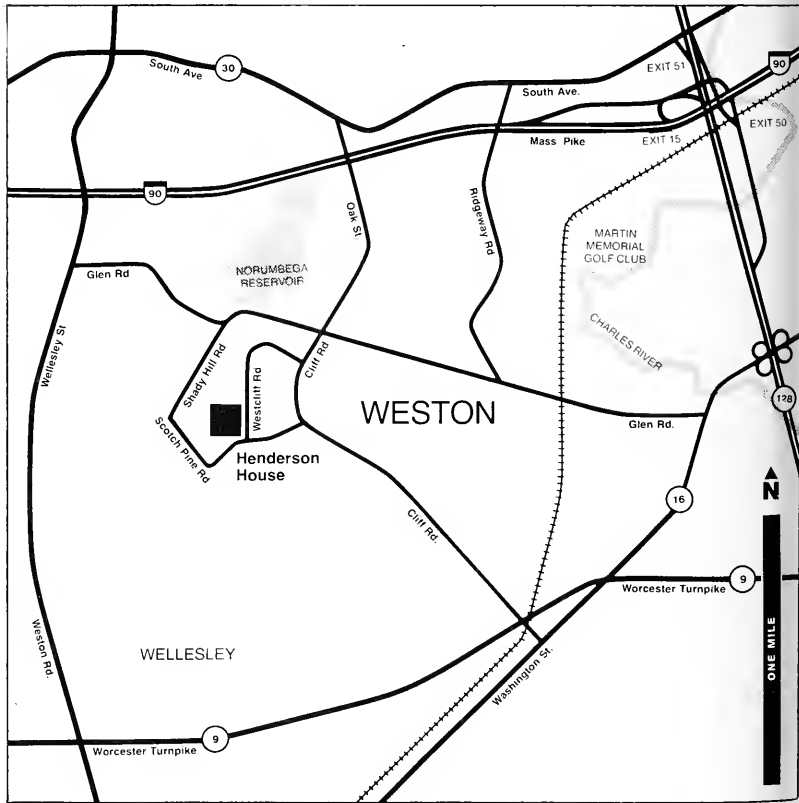
Underground Tunnel

Maps are provided by the
Visitor Information Center
115 Richards Hall, extension 2736.
Some buildings on this map are used but
not owned by Northeastern University.
NUP 6.1.5

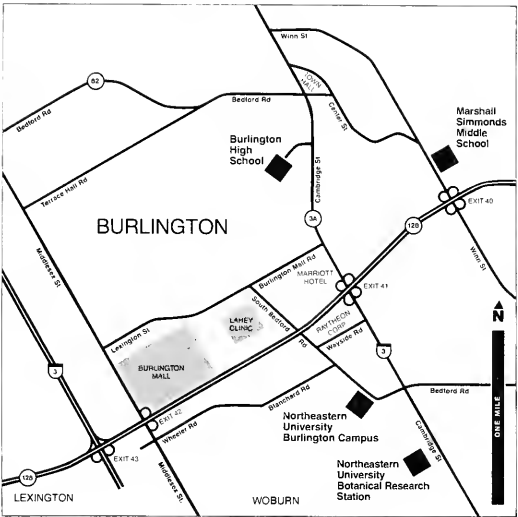
The Warren Center



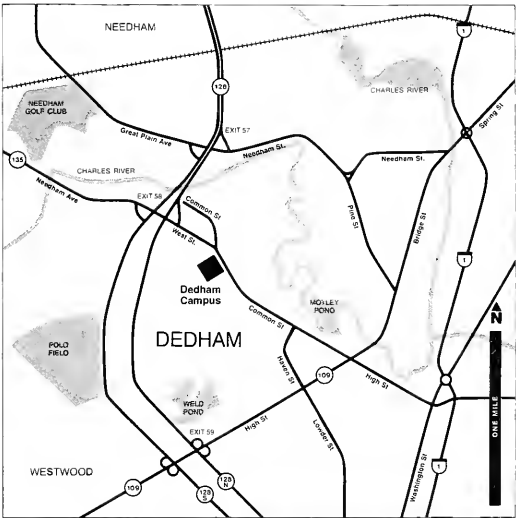
Henderson House



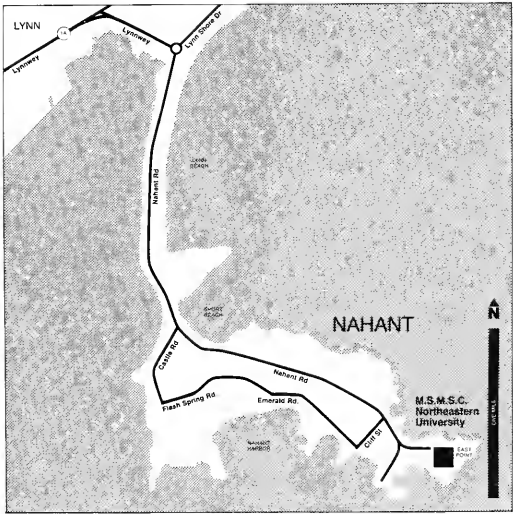
Burlington Campus



Dedham Campus



Nahant Campus



The Governing Boards and Officers of the University

The Corporators

*Member of the Board of Trustees

**Honorary Trustee

***Lifetime Trustee, Emeritus

Class of 1985

Julius Abrams

Yousef A. As'ad

**Diana J. Auger

Allen G. Barry

Lincoln C. Bateson

***Roy H. Beaton

***E. Gregg Bemis

Beverly Ann Bendekgey

Robert P. Berkowitz

Alfred M. Bertocchi

Gerald W. Blakeley, Jr.

Stuart Marshall Bloch

S. Whitney Bradley

Melvin B. Bradshaw

Rexford A. Bristol

Edward W. Brooke

William L. Brown

William H. Bruce, Jr.

John L. Burns

Victor C. Bynoe

*Norman L. Cahners

James F. Carlin

***Richard P. Chapman

Richard P. Chapman, Jr.

Robert F. Chick

Vessarios G. Chigas

Logan Clarke, Jr.

Livingstone N. Coakley

Abram T. Collier

T. Paul Connolly

James J. Costello

Edward Creiger

H. James Crossan, Jr.

Roger C. Damon

J. H. Dow Davis

Melanie C. Dean

Virginia S. Devine

William O. DiPietro

Alfred di Scipio

Estelle Dockser

Dorothy Dodge

**William R. Driver, Jr.

*James V. Fetchero

*Ernest Henderson III

*D. Brainerd Holmes

*Carl R. Hurtig

*Harvey C. Krentzman

*John P. LaWare

*George J. Matthews

*Ruth B. Stuart

*James L. Waters

Class of 1986

*William F. Allen, Jr.

*Frederick L. Brown

William S. Edgerly

William Elfers

***Byron K. Elliott

***William P. Ellison

Robert Erickson
 *Frank L. Farwell
 Joseph D. Feaster, Jr.
 Phil David Fine
 Neal F. Finnegan
 Albert S. Frager
 Brenda J. Furlong
 Murray J. Gart
 Paul W. Glennon
 *Lloyd S. Glidden, Jr.
 John L. Grandin
 **Donald B. Guy
 *Allan M. Hale
 Edmund Blair Hawley
 Michael E. Haynes
 James S. Hekimian
 William Hellman
 James S. Herbert
 Colby Hewitt, Jr.
 Richard D. Hill
 Thomas Hollis, Jr.
 Robert W. Holmes
 Hartwell G. Howe
 John S. Howe
 Howard M. Hubbard
 Richard P. Johnson
 ***Henry C. Jones
 Walter B. Kelley
 ***Frances C. Kenerson
 Edward M. Kennedy
 Fenton G. Keyes
 Calvin A. King
 ***Asa S. Knowles
 Evelyn M. Lane
 Maurice Lazarus
 Allyn Levy
 Elma Lewis
 Edward A. Loring
 George M. Lovejoy, Jr.
 Peter E. Madden
 Maurice Mann
 *Kathryn A. Nicholson
 *George A. Snell
 *D. Thomas Trigg
 *Martin F. Walsh

Class of 1987

*Vincent Barletta
 *Louis W. Cabot
 *John J. Cullinane
 *Arnold S. Hiatt
 *Kenneth A. Loftman
 *John Lowell
 *Roderick M. MacDougall
 Robert C. Marini
 Evelyn A. Marran
 **Lawrence H. Martin
 M. Dorothy Massey
 Walter E. Mattson
 Peter H. McCormick
 William J. McCune, Jr.
 John G. McElwee
 *Katherine S. McHugh
 John A. McNeice, Jr.
 Dominic Meo, Jr.
 Don G. Mitchell
 Donald H. Moore
 Frank E. Morris
 James A. Morris
 E. James Morton
 N. Laurence Nagle
 William H. Nichols, Jr.
 Bernard J. O'Keefe
 Stanley C. Olsen
 James H. Orr
 Edward O. Owens
 Ara Oztemel
 Edward S. Parsons
 Theodore R. Peary
 Lawrence T. Perera
 Nicholas V. Petrou
 Edward E. Phillips
 **Thomas L. Phillips
 Edward D. Phinney
 Rudolph F. Pierce
 Jerome M. Powell
 Albert Pratt
 John F. Prendiville
 George Putnam
 Blanche M. Quaid
 ***Francis J. Quirico

William H. Raye, Jr.
Kathleen M. Rice
D. Paul Rich
Robert Riesman
Daniel J. Roberts
*Charlotte B. Smith
*An Wang

Class of 1988

Louis H. Barnett
*Thomas E. Cargill, Jr.
Gary L. Countryman
Michael J. Cronin
Carl E. Dantas
*Kenneth G. Fisher
*Joseph E. Heney
Edward C. Johnson 3d
*Robert L. Johnson
*George S. Kariotis
*Diane H. Lupean
Peter F. O'Connell
*William J. Pruyn
**Dwight P. Robinson, Jr.
Ralph B. Rogers
Ronald L. Rossetti
Ernest J. Sargeant
Donald W. Seager
Sydney Shaftman
James L. Shanahan
Robert E. Siegfried
*Dorothy M. Simon
Philip A. Singleton
Paul D. Slater
**Donald W. Smith
***Farnham W. Smith
O. Phillip Snowden
*Bernard Solomon
Robert C. Sprague
Milton Stern
David B. Stone
Galen Luther Stone
Stephen J. Sweeney
H. Patricia Taylor
Lawrence I. Templeman
Charles H. Tenney II
Almore I. Thompson

Milton A. Thompson
W. Nicholas Thorndike
Alan D. Tobin
Paul E. Tsongas
Joseph F. Turley
***Chaplin Tyler
Samuel Wakeman
Lloyd B. Waring
David T. Wendell
Donald F. Whiston
William C. White
*Robert H. Willis
Richard W. Young
**Alvin C. Zises

Officers of the Corporation and the Board of Trustees

Robert H. Willis, *Chairman*
Norman L. Cahners, *Vice Chairman*
Frank L. Farwell, *Vice Chairman*
D. Thomas Trigg, *Vice Chairman-Finance*
Barbara F. Burke, *Secretary*
Vincent J. Lembo, *Assistant Secretary*
Byron K. Elliott, *Lifetime Chairman Emeritus*
William R. Driver, Jr., *Honorary Vice Chairman*
Dwight P. Robinson, Jr., *Honorary Vice Chairman*
Farnham W. Smith, *Honorary Vice Chairman*

Class of 1985

Norman L. Cahners
James V. Fetchero
Ernest Henderson III
D. Brainerd Holmes
Carl R. Hurtig
Harvey C. Krentzman
John P. LaWare
George J. Matthews
Ruth S. Stuart
James L. Waters

Class of 1987

Vincent Barletta
Louis W. Cabot
John J. Cullinane
Arnold S. Hiatt
Kenneth A. Loftman
John Lowell
Roderick M. MacDougall
Katherine S. McHugh
Charlotte B. Smith
An Wang

Class of 1986

William F. Allen, Jr.
Frederick L. Brown
Frank L. Farwell
Lloyd S. Glidden, Jr.
Allan M. Hale
Kathryn M. Nicholson
George A. Snell
D. Thomas Trigg
Martin F. Walsh

Class of 1988

Thomas E. Cargill, Jr.
Kenneth G. Fisher
Joseph E. Heney
Robert L. Johnson
George S. Kariotis
Diane H. Lupean
William J. Pruyn
Dorothy M. Simon
Bernard Solomon
Robert H. Willis

Ex Officio
**Kenneth G. Ryder

Honorary Trustees
Diana J. Auger
William R. Driver, Jr.
Donald B. Guy
Lawrence H. Martin
Thomas L. Phillips
Donald W. Smith
Alvin C. Zises

Lifetime Trustees, Emeriti
Roy H. Beaton
F. Gregg Bemis
Richard P. Chapman
Byron K. Elliott
William P. Ellison
Henry C. Jones
Frances C. Kenerson
Asa S. Knowles
Francis J. Quirico
Dwight P. Robinson, Jr.
Farnham W. Smith
Chaplin Tyler

Board of Overseers

Class of 1986
William Elfers
Phil David Fine
Neal F. Finnegan
Albert S. Frager
Brenda J. Furlong
James S. Hekimian
Peter E. Madden

Class of 1987
Robert C. Marini
Edward O. Owens
Robert Riesman

Class of 1988
H. Patricia Taylor
W. Nicholas Thorndike
Alan D. Tobin

Class of 1989
Richard P. Chapman, Jr.
Vessarios G. Chigas
T. Paul Connolly

Administrative Organization

Officers of the University

Philip T. Crotty, AB, AM, MBA, EdD, *Vice President for Academic Operations and Vice Provost*
John A. Curry, AB, EdM, EdD, *Executive Vice President*
Edmund L. Deltano, BA, *Vice President for Finance*
Christopher F. Kennedy, AB, EdM, *Vice President for Administration*
James B. King, BA, LLD (hon), *Senior Vice President for Public Affairs*
Asa S. Knowles, AB, AM, LLD, LittD, ScD, DBA, ScD in Bus Ed. (hon), *Chancellor*
Philip LaTorre, BS, MS, *Vice President for Human Resource Management*
John A. Martin, BS, MBA, *Vice President for Business*
John D. O'Bryant, BS, MEd, *Vice President for Student Affairs*
Anthony N. Penna, BS, MA, DA, *Senior Vice President for Academic Affairs and Provost*

Eugene M. Reppucci, Jr., BS, MEd, *Senior Vice President for University Development*
Daniel J. Roberts, BS, MBA, EdM, *Senior Vice President–Treasurer*
Kenneth G. Ryder, AB, MA, LHD, LittD (hon), *President*
Royal K. Toebes, BS, MBA, *Vice President for Alumni Development*
Karl Weiss, BS, PhD, *Vice President for Research and Vice Provost*
Roy L. Wooldridge, BS, EdM, TLD, LHD (hon), *Vice President for Cooperative Education*

**Academic Deans, Directors of Schools, and
General Administrative Officers**

Richard Astro, BA, MA, PhD, *Dean of the College of Arts and Sciences*
Alan R. Benenfeld, BMEtE, MLS, MS, *Dean and Director of University Libraries*
Maryann G. Billington, AB, MBA, *Associate Dean and Director of the Graduate School of Business Administration*
Irwin M. Cohen, BS, MS, *Director of Men's Athletics*
Martin J. Damian, BS, *Bursar*
Charles Devlin, BS, MEd, *Dean of Student Financial Services*
Elisabeth M. Drake, SB, ScD, *Acting Dean of the College of Engineering*
Clifford J. Fralen, BS, MSE, MBA, *Director of the Physical Plant*
David R. Freeman, BMgtE, MS, PhD; *Associate Dean of Engineering and Director of the Graduate School of Engineering*
William A. Frohlich, BA, *Dean and Director of University Press*
Job E. Fuchs, MD, *Director of Health Services*
Daniel J. Givelber, AB, LLB, *Dean of the School of Law*
Thomas E. Hulbert, BMgtE, MS, *Director of School of Engineering Technology and Associate Dean of Engineering*
Ellen S. Jackson, BA, EdM, CAGS, DH, DHL (hon), *Dean and Director of Affirmative Action*
John W. Jordan, BS, MEd, *Dean of University College*
Paul M. Kalaghan, AB, MS, PhD, *Dean of the College of Computer Science*
Paul M. Lepley, BS, MEd, EdD, *Dean of the Boston-Bouvé College of Human Development Professions*
Juanita O. Long, BSN, MSN, CAGS, EdD, *Dean of Nursing*
Kathryn Luttgens, BS, MS, PhD, *Associate Provost*
Philip R. McCabe, BA, MEd, *Dean of Admissions*
Philip R. McDonald, BA, MBA, DBA, *Dean of the College of Business Administration*
Edmund J. Mullen, BA, MEd, *University Registrar*
J. Edward Neighbor, BS, MS, PhD, *Associate Dean of the College of Arts and Sciences and Director of the Graduate School*
John H. Northrup, AB, MS, *Director, School of Professional Accounting*

Paul M. Pratt, BS, MEd, *Dean of the Department of Cooperative Education*
 Edward W. Robinson, BS, EdM, *Dean of Students*
 Norman Rosenblatt, AB, PhD, *Dean of Criminal Justice and Director of the Graduate Program in Criminal Justice*
 Jeanne L. Rowlands, BA, BS, MA, *Director of Women's Athletics*
 Phyllis M. Schaen, BS, MEd, EdD; *Dean of Administration*
 James J. Gozzo, PhD, *Associate Dean and Director of the Graduate School of Pharmacy and Allied Health Professions*
 Arthur D. Smith, BS, MA, PhD, *Associate Provost*
 Janice Walker, AB, *Assistant Dean and Director of the Graduate School of the Boston-Bouve College of Human Development Professions*
 Mitchell Wand, SB, PhD, *Associate Dean and Director of Graduate Studies of the College of Computer Science*

General University Committees

University Council, 1985-86

Kenneth G. Ryder, *Chairman*
 John A. Curry, *Vice Chairman*
 Anthony N. Penna, *Vice Chairman*
 Barbara F. Burke, *Secretary*

Richard Astro	Kathryn Luttgens
Alan R. Benenfeld	John A. Martin
Charles W. Coffin	Philip R. McCabe
Philip T. Crotty	Philip R. McDonald
Edmund L. Deltano	Christopher Mosher
Elisabeth M. Drake	John D. O'Bryant
Clifford J. Fralen	Donald G. Porter
*Maurice E. Gilmore	Paul M. Pratt
Daniel J. Givelber	*Gordon E. Pruett
Charles L. Hallenborg	Eugene M. Reppucci, Jr.
Ellen S. Jackson	Daniel J. Roberts
John W. Jordan	Edward W. Robinson
Paul M. Kalaghan	Norman Rosenblatt
Christopher F. Kennedy	Phyllis M. Schaen
James B. King	Gerald E. Schumacher
William B. Kneeland, Jr.	Arthur D. Smith
Roland E. Latham	Michael J. Tighe
Philip LaTorre	Royal K. Toebes
Vincent J. Lembo	Joy W. Viola
Paul M. Lepley	Karl Weiss
Juanita O. Long	Raymond R. Williams
	Roy L. Wooldridge

*Faculty Senate Representatives

**The Faculty Senate,
1985–1986**

Anthony N. Penna, <i>Presiding Officer</i>	
*Rae Andre	*Paul M. Lepley
*Richard Astro	M. X. Lesser
*Alan R. Benenfeld	Ali Malekzadeh
Ralph S. Blanchard, Jr.	Bertram J. Malenka
Bruce Bolnick	Ronald J. McAllister
Franklyn K. Brown	Joseph Meier
Leslie A. Burg	Mary Jo Ondrechen
Marilyn A. Cairns	Stuart S. Peterfreund
*John A. Curry	Thomas E. Phalen, Jr.
*Elisabeth M. Drake	Harlan D. Platt
Carl W. Eastman	*Paul M. Pratt
William L. Faissler	Gordon E. Pruett
Barbara Fraumeni	*Norman Rosenblatt
Marvin H. Friedman	Betty Salzburg
Maurice E. Gilmore	Robert A. Schatz
Robert A. Gonsalves	*Gerald E. Schumacher
Richard E. Grojean	Robert Sheehan
Donald M. Jacobs	M. Delaine Williamson
*Paul M. Kalaghan	
Israel Katz	
*David N. Leggett	*Appointed by the President

Organization of the Graduate Schools

Administration

Kathryn Luttgens, PhD, <i>Associate Provost</i>
Maryann G. Billington, MBA, <i>Assistant Dean and Director of the Graduate School of Business Administration</i>
David R. Freeman, PhD, <i>Associate Dean and Director of the Graduate School of Engineering</i>
John C. Monks, JD, <i>Associate Dean of the School of Law</i>
J. Edward Neighbor, PhD, <i>Associate Dean and Director of the Graduate School of Arts and Sciences</i>
John Northrup, MS; <i>Director of the Graduate School of Professional Accounting</i>
Norman Rosenblatt, PhD, <i>Dean and Director of the Graduate School of Criminal Justice</i>
Gerald E. Schumacher, PharmD; <i>Dean and Director of the Graduate School of Pharmacy and Allied Health Professions</i>
Janice Walker, AB, <i>Assistant Dean and Director of the Graduate School of the Boston-Bouvé College of Human Development Professions</i>
Mitchell Wand, SB, PhD; <i>Associate Dean and Director of Graduate Studies of the College of Computer Science</i>

**University Graduate
Council**

The Council determines broad policies and regulations governing the conduct of graduate work. All new graduate programs must be approved by the Council.

Officers

Kathryn Luttgens, *Chairman*
TBA, *Vice Chairman*
Ann Kellner, *Secretary*

Robert Gilbert
William Gillespie
Thomas F. Harrington
Donald Jacobs
Gwilym Jones
Mervyn Lynch
Harry Mackay
Ronald McAllister
Afsaneh Nahavandi
Anil Pandya
Marjorie Platt
Richard Porter
John Proakis
Robert Raffauf
Robert Redden

Administrative Members

Maryann G. Billington
David R. Freeman
J. Edward Neighbor
Norman Rosenblatt
Gerald Schumacher
Janice Walker
Mitchell Wand

John Schoon
Raoul Smith
Marius Solomon
Herbert Sussman
Larry Swanson
Alfred Viola
Gregory Wassall
Barbara Waszczak
William Willis
John Williams

Elected Faculty Members

Charles Berg
Mehdi Boroujerdi
Catherine Certo
Romine Deming
Larry Finkelstein
James Fox
Stephen Gallant
Marvin Gettner
Lewis Geyer

**Graduate
Administrative
Committee**

Kathryn Luttgens, *Chair*
Ann Kellner, *Secretary*
Linda J. Allen
Maryann G. Billington
David R. Freeman
John C. Monks
J. Edward Neighbor

John Northrup
Norman Rosenblatt
Gerald E. Schumacher
Deborah H. Stein
Janice Walker
Mitchell Wand
Arlene Greenstein

**Committee of the
Graduate School of
Arts and Sciences**

Bohumil Cenk, *Professor of Mathematics*
Marvin W. Gettner, *Professor of Physics*
Daryl A. Hellman, *Professor of Economics*
Donald M. Jacobs, *Professor of History*
Gwilym S. Jones, *Associate Professor of Biology*
Harry A. Mackay, *Associate Professor of Psychology*
Ronald J. McAllister, *Associate Professor of Sociology*
Stewart Reiser, *Associate Professor of Political Science*
John L. Roebber, *Professor of Chemistry*

Herbert L. Sussman, *Professor of English*
Gregory H. Wassall, *Associate Professor of Economics*
William James Willis, *Assistant Professor of Journalism*

Delivery of Services

The University assumes no liability, and hereby expressly negates the same, for failure to provide or delay in providing educational or related services or facilities or for any other failure or delay in performance arising out of or due to causes beyond the reasonable control of the University, which causes include, without limitation, power failure, fire, strikes by University employees or others, damage by the elements and acts of public authorities. The University will, however, exert reasonable efforts, when in its judgment it is appropriate to do so, to provide comparable or substantially equivalent services, facilities or performance, but its inability or failure to do so shall not subject it to liability.

The Northeastern University catalog contains current information regarding the University calendar, admissions, degree requirements, fees, and regulations, and such information is not intended to be and should not be relied upon as a statement of the University's contractual undertakings.

Northeastern University reserves the right in its sole judgment to promulgate and change rules and regulations and to make changes of any nature in its program, calendar, admissions policies, procedures and standards, degree requirements, fees, and academic schedule whenever it is deemed necessary or desirable, including, without limitation, changes in course content, the re-scheduling of classes, canceling of scheduled classes and other academic activities and requiring or affording alternatives for scheduled classes or other academic activities, in any such case giving such notice as is reasonably practicable under the circumstances.

Northeastern will do its best to make available to you the finest education, the most stimulating atmosphere and the most congenial conditions it can provide. But the quality and the rate of progress of your academic career is in large measure dependent upon your own abilities, commitment, and effort. This is equally true with respect to professional advancement upon completion of the degree or program in which you are enrolled. The University cannot guarantee that you will obtain or succeed at any particular job; that will depend upon your own skills, achievement, presentation, and other factors such as market conditions at that time. Similarly, in many professions and occupations there are increasing requirements imposed by federal and state statutes and regulatory agencies for certification or entry into a particular field. These may change during the period of time when you are at Northeastern and they may vary from state to state and from country to country. While the University stands ready to help you find out about these requirements and changes, it is your responsibility to initiate the inquiry because the University has no other way of knowing what your expectations and understandings are.

In brief, the University is there to offer you educational opportunities and choices and to assist you in finding the direction in which you want to steer your educational experience, but you are a partner in this venture with an obligation and responsibility to yourself.

Northeastern University's Antidiscrimination Policy

Northeastern University is committed to a policy of equal opportunity for all students and employees without regard to race, color, religion, sex, sexual preference, national origin, handicap, or veteran status. The University pro-

hibits discrimination in all matters involving admissions, registration, and all official relationships with students, including evaluation of academic performance.

Equal Opportunity Employment Policy

Northeastern University is an equal opportunity employer. It is institutional policy that there shall be no discrimination against any employee or applicant for employment because of race, color, religion, sex, age, national origin, handicap, or veteran status.

Northeastern also prohibits discrimination against any employee regarding upgrading, demotion or transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training. In addition, Northeastern adheres to Affirmative Action guidelines in all recruitment endeavors.

Furthermore, Northeastern will not condone any form of sexual harassment (which is defined as the use of unwelcome sexual advances, requests for favors, and other verbal or physical conduct of a sexual nature) as an explicit or implicit condition of employment, as the basis for employment decisions, or as interfering with an individual's work performance by creating an intimidating, hostile, or offensive work environment.

Inquiries concerning our equal opportunity policies may be referred to the University Title IX Coordinator/Compliance Officer for Section 504 of the Rehabilitation Act of 1973, Affirmative Action Office, Richards Hall, 617-437-2133.

Family Educational Rights and Privacy Act

In accordance with the Family Educational Rights and Privacy Act of 1974, Northeastern University permits its students to inspect their records, whenever appropriate, and to challenge specific parts of them when they feel it necessary to do so. Specific details of the law as it applies to Northeastern are printed in the student handbooks and are distributed annually at registrations of the University colleges and graduate schools.

Office of Services for the Handicapped

The Office of Services for the Handicapped (OSH) provides a variety of support services and general assistance to all of Northeastern's disabled students and employees. The University's efforts to comply with the Rehabilitation Act of 1973 are coordinated by Ruth Bork, OSH Director, 5 Ell Center, 617-437-2675.

Accreditation Statement

Northeastern University is accredited by the New England Association of Schools and Colleges, Inc., which accredits schools and colleges in the six New England states. Accreditation by the association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators.

Tuition rates, all fees, rules and regulations, courses and course content are subject to revision by the President and the Board of Trustees at any time.

Emergency Closing of the University

Northeastern University has made arrangements to notify students, faculty, and staff by radio when it becomes necessary to cancel classes because of extremely inclement weather. AM radio stations WBZ (1030), WEEI (590), WHDH (850), WRKO (680), and FM stations WBCN (104.1), and WROR (98.5) are the stations authorized to announce the University's decision to close. Since instructional television courses originate from live or broadcast facilities at the University, neither the classes nor the courier service operate when the University is closed.

International Mission Statement

NORTHEASTERN UNIVERSITY, a world leader in cooperative education, acknowledges the increasing interdependence among nations, and, therefore, identifies its mission as preparing its graduates to live and work in an interdependent world. The University deems it essential that its students, both in the professions as well as in the humanities, develop a greater awareness and understanding of those social, political and economic issues that transcend national boundaries. So interconnected are these issues, that a recognition of them coupled with an appreciation of the diverse culture which gave rise to them is necessary for the development of productive and responsible citizens of the world community.

To accomplish this goal, Northeastern University actively seeks qualified students from abroad to enroll in its undergraduate and graduate programs in such numbers and with such geographic origins so as to create and foster a truly global exchange of ideas and values among students, faculty, and staff.

The University also encourages all colleges to continually develop and expand course offerings to include international issues and cross-cultural aspects and supports faculty to teach the conduct research in the interrelationship among nations and peoples. The University promotes international understanding and the sharing of ideas with institutions throughout the world by virtue of its faculty and staff exchanges and its study and work abroad programs for students.

Finally, the University recognizes that it has a special responsibility to share its expertise and to cooperate with international organizations, the local community, its alumni, and diverse segments of the public in an effort to promote greater awareness of global issues and events.

Index

- Absence, 25
- Academic Computer Services, 166
- Accounting, Graduate School of Professional, 16
- Administrative assistantships, 161–162
- Admission
 - to doctoral degree program*, 27
 - to Graduate School of Arts and Sciences*, 21
 - to interdisciplinary programs*, 29
- Adult education, 6
- Anthropology
 - admission requirements*, 143–144
 - course listings*, 153–154
 - faculty*, 141–142
 - financial aid in*, 144–145
 - master's degree in*, 147–148
 - research in*, 142–143
- Antidiscrimination policy, 183
- Application
 - for admission*, 19–21
 - for diploma*, 25
- Arts and Sciences, Graduate School of
 - admission to*, 21
 - application to*, 19–21
 - certificate programs*, 12
 - changes in requirements in*, 25
 - continuous attendance at*, 25
 - course load*, 22–24
 - credit hours*, 25
 - diploma in*, 25
 - doctor of philosophy degree programs*, 11, 27–29
 - grading system*, 24
 - interdisciplinary programs*, 29–30
 - master's degree programs*, 11, 26–27
 - registration in*, 22
 - residence requirement*, 22
 - student categories*, 21–22
 - withdrawal from course in*, 25
- Assistantships, 161–162
- Attendance, 25
- Auditing, 25
- Biology
 - course listings*, 42–44
 - doctor of philosophy*, 39–41
- faculty*, 33
- graduate program*, 34–35
- interdisciplinary programs*, 41–42
- master of science*, 35–37
- master of science in health sciences*, 37–39
- special student status*, 41
- Boston
 - campus*, 164, 171
 - Northeastern University and*, 10
- Boston-Bouvé College of Human Development Professions, Graduate School of
 - certificate programs*, 12
 - degree programs*, 12
 - nondegree programs*, 12
- Burlington Campus, 165, 173
- Business Administration, Graduate School of, 13
 - see also Public administration, master's program*
- Campuses
 - Boston*, 164, 171
 - suburban*, 164–165, 172–173
- Career Development and Placement, Department of, 166–167
- Chemistry
 - admission requirements*, 47
 - areas of advanced study*, 52–53
 - course listings*, 56–57
 - doctor of philosophy degree*, 49–50, 52
 - faculty*, 45–46
 - interdisciplinary programs*, 53–56
 - master of science degree*, 47–49
 - master of science in clinical chemistry*, 53–56
 - part-time program in*, 53–56
 - program planning*, 47
 - research in*, 46–47, 52–53
- Commencement card, 25
- Comprehensive examination
 - in doctoral degree program*, 28
 - in master's degree program*, 26
- Computer Service, 166
- Cooperative education, 5–6
- Counseling and Testing Center, 168
- Course load, 22, 24
 - in doctoral degree program*, 28

- Credential service, 167
- Credit
 - quarter hours of*, 25
 - transfer*, 27, 28
- Criminal Justice, Graduate School of, 13
- Declaration and Certification of Finances (DCF), 20
- Dedham Campus, 165, 173
- Degree candidacy, 22, 28
- Degree programs, 11–14
- Diploma, application for, 25
- Dissertation, 28
- Doctor of philosophy degree
 - concentrations for*, 11
 - degree candidacy for*, 22, 28
 - registration for*, 29
 - requirements for*, 27–29
 - time limitation for*, 29
 - transfer credit toward*, 28
- Economics
 - certificate program*, 59–60
 - course listings*, 66–67
 - doctor of philosophy degree*, 64–66
 - faculty*, 58–59
 - master of arts in*, 61–64
 - master of science in*, 60–61
 - research in*, 59
- Ell Student Center, 167
- Emergency closing, 185
- Engineering, Graduate School of, 13
- English
 - admission requirements*, 69
 - certificate of advanced graduate study*, 77–78
 - course listings*, 79–80
 - faculty*, 68–69
 - master of arts degree*, 69–75
 - master of technical and professional writing*, 75–77
 - proficiency in*, 20–21
 - research in*, 69
 - technical writing training program*, 77
- Environmental protection, concentration in, 98
- Equal opportunity employment policy, 184
- Facilities and resources, 164–173
- Family Educational Rights and Privacy Act, 184
- Fees, 159
- Finances, Declaration and Certification of (DCF), 20
- Financial aid
 - Office of*, 160
 - for research*, 7
 - for tuition*, 159–163
- Financial obligations, 159
- Foreign languages: *see* Language requirement
- Foreign students: *see* International students
- GAPSFAS, 160
- Government: *see* Political science
- Grading system, 24
- Graduate and Professional School Financial Aid Service (GAPSFAS), 160
- Graduate Records Examination (GRE), 19
- Grants, 163
- GRE, 19
- Guaranteed Student Loan Program, 161
- Handicapped, Office of Services for, 168, 184
- Health care
 - legal issues in*, 98–99
 - at University*, 167–168
- Health sciences, master of science in, 37, 39
- Henderson House, 165, 172
- History
 - course listings*, 84–86
 - faculty*, 81–82
 - master's degree in*, 82–84
 - research in*, 82
- Housing, 166
- Human resources utilization, legal issues in, 99
- Incomplete, 24
- Interdisciplinary programs, 29–30
- International mission statement, 185
- International students
 - admission of*, 21
 - application by*, 20–21
 - Office for*, 168
 - teaching assistant orientation for*, 21
- Job bank, 167
- Journalism
 - admission requirements*, 87
 - cooperative education*, 87
 - course listings*, 90
 - faculty*, 87
 - master of arts in*, 88
 - master of journalism in news media management*, 89
 - program planning in*, 87
 - transfer credit in*, 87
- Journals, 8
- Labor Market Studies, Center for, 93
- Lane Health Center, 167–168
- Language requirement
 - in doctoral degree program*, 28
 - in master's degree program*, 27

- Law, Policy, and Society
 - admission requirements*, 94
 - concentrations in*, 97–100
 - doctoral program*, 94–96
 - faculty*, 91–93
 - general electives in*, 97
 - master's program*, 96–97
 - program administration*, 93
 - research in*, 93
- Law, School of, 16
- Libraries, 165–166
- Linguistics, concentration in, 71–72
- Literature, concentrations in, 70–71
- Loans, 160, 161
- Maps, 171–173
- Marine Science and Maritime Studies Center, 165
- Master's degree
 - academic requirements*, 26
 - comprehensive examination*, 26
 - concentrations*, 11
 - language requirement*, 27
 - thesis*, 26
 - time limitation*, 27
 - transfer credit toward*, 27
- Mathematics
 - admissions requirements*, 103
 - course listings*, 106–108
 - doctor of philosophy degree*, 105–106
 - faculty*, 101–102
 - master of science degree*, 103–105
 - research in*, 102–103
- Medical care, 167–168
- Medical Manpower Studies, Center for, 93
- Mental retardation, 138–139
- Miller Analogies Test, 20
- Minority students
 - Fellowships for*, 161
 - Office of*, 168
- Multicultural Student Affairs, Office of, 168
- Nahant Campus, 173
- National Direct Student Loan, 160
- Network Northeastern (NNU), 168–169
- Northeastern University
 - accreditation of*, 184–185
 - adult education at*, 6
 - and Boston*, 10
 - cooperative education at*, 5–6
 - emergency closing of*, 185
 - facilities and resources of*, 164–173
 - governing board and officers of*, 174–183
 - history of*, 5
 - liabilities of*, 183
 - maps of*, 171–173
 - research at*, 7–8
 - Tuition Assistantships (NUTA)*, 162
- Oral examination, 28
- Orientation, for international teaching assistants, 21
- Pharmacy and Allied Health Professions, Graduate School of, 14
- PhD: *see* Doctor of philosophy degree
- Physical examination form, 167–168
- Physics
 - admissions procedure*, 112, 114
 - advanced study and research in*, 110–112
 - assistantships in*, 114–115
 - course listings*, 120–121
 - doctor of philosophy degree*, 117–120
 - faculty*, 109–110
 - master of science degree*, 115–117
- Placement service, 166–167
- Political science
 - admissions requirements*, 124–125
 - course listings*, 130–132
 - faculty*, 122–123
 - master of arts degree*, 125–127
 - master of public administration degree*, 127–129
 - research in*, 123–124
- President's message, 3
- Provisional student, 21
- Psychology
 - course listings*, 139–140
 - doctoral program*, 137–138
 - faculty*, 133–134
 - master's degree in applied behavior analysis*, 138–139
 - research in*, 134–136
- Public administration, master's program
 - admission to*, 124–125
 - concentrations in*, 128–129
 - off-campus facility*, 129
 - requirements in*, 127–128
- Qualifying examination, 28
- Quarter hours, 25
- Records, inspection of, 184
- Refunds, 159
- Registration, 22
 - in doctoral degree program*, 29
 - officer*, 30
- Requirements, changes in, 25
- Research, 7–8
 - assistantships*, 162
- Residence hall staff positions, 163
- Residence requirement, 22
 - for doctoral degree*, 28
- Scholarships, 161
- Snow emergency, 185

- Social policy and deviant behavior, 99–100
- Social Research, Center for Applied, 93
- Sociology
 - admissions requirements*, 143–144
 - course listings*, 153–156
 - doctor of philosophy degree in*, 148–153
 - faculty*, 141–142
 - financial aid in*, 144–145
 - master's degree in*, 147–148
 - research in*, 142–143
- Special student, 22
- Sports, 167
- Student Center, 167
- Student loans, 160, 161
- Suburban facilities, 164–165, 172–173
- Teaching assistants, 162
 - orientation for international*, 21
- Technical writing
 - certificate program in*, 77
 - master of*, 75–76
 - master of arts degree in*, 72–73
- Test of English as a Foreign Language (TOEFL), 20–21
- Thesis, for master's degree program, 26
- TOEFL, 20–21
- Transfer credit
 - in doctoral degree program*, 28
 - in master's degree program*, 27
- Tuition, 159
 - assistantships*, 161–162
- Urban and Regional Economic Studies, Center for, 93
- Warren Center, 165, 172
- Withdrawal, 25, 159
- Work-Study Program, 160
- Writing
 - linguistics and*, 71–72
 - technical and professional*, 72–73, 75–77



